AMERICAN

Journal of Mining,

Milling, Oil-Boring, Geology, Mineralogy, Metallurgy, etc.

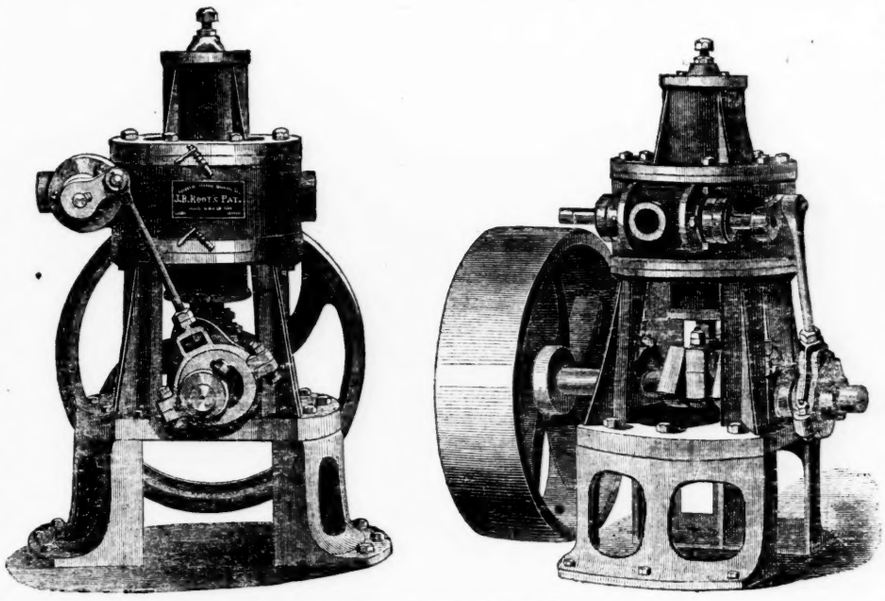
VOLUME II.
NUMBER 15.

NEW YORK, JANUARY 5, 1867.

$4 A YEAR IN ADVANCE.
SINGLE COPIES TEN CENTS.

STEAM ENGINES.

Few realize the extent of the machinery business of this great metropolis. In the steam engine branch alone, we are informed that sufficient is done in a single year to buy out a Midas, or make a dream of contentment for a shoddy contractor. Here in our salesrooms may be found hundreds of engines, each differing some way from the other, and every one possessed of peculiarities which others have not. Indeed, were the improvements of a single year collected and described in a book, it would reach such gigantic proportions as would affright even an Appleton or a Harper. If necessity is the mother of invention, competition is its father. The subject of the accompanying engraving, from its being, as we are assured by very good authority, *a very effective engine for any purpose*, is one that must mept the wants of many, particularly the mining public, where economy in weight is so important. It is manufactured by the Root Steam Engine Co, 155 Duane street, N. Y. city, who state that "for durability and economy in the use of steam, it is equal to any in use, and will be found very compact, simple and complete. The workmanship and finish is inferior to none, and for lightness and convenience of application for every kind of use, with the saving in space and reduction in price, it should have the inspection and attention of all wanting steam power. It is warranted to do the work stated with 50 pounds piston pressure and speed, varying according to size and the power required. It is specially adapted for propellers of every size, and for mining, manufacturing and farming purposes, has a great many advantages." For further particulars, attention is directed to the advertisement in another column of this week's issue.



ROOT'S PATENT TRUNK ENGINE.

Gold Mining in Italy.

It cannot fail to be encouraging to those interested in the development of the Italian gold mines to find that the returns continue to gradually increase. Another remittance from the Pestarena, Vallanzasca, and Val Toppa mines has been received, amounting to about 1357 ozs. of fine gold, of the value of something like £4,400. The yield per ton of the Pestarena ore treated during fifty-two days has again been over two ounces of gold per ton of ore. That mine has now returned, since April 1, over £9,000 worth of gold.

The Recent Colliery Explosions—1000 British Miners annually Slaughtered.

The news which reached us by telegraph of the fearful tragedy in the Oaks Colliery at Barnsley is, unhappily, more than confirmed. It fell short, indeed, of the truth, for it is now almost certain that nearly 400 men and boys must have perished in the first explosion on Wednesday, and that 20 or 30 volunteers engaged in searching for their missing comrades were all but one killed by a second explosion on Thursday morning. There is no recorded instance, we believe, of so fatal a catastrophe in a coal mine. The most terrible accidents of the same kind within the last few years, if not within living memory, were those at the Lundhill and Hartley collieries. In the former, which happened in 1857, the number of victims was 189; in the latter, which happened in January, 1860, the number was 69. Looking at these figures alone, we might be tempted to believe that in spite of the precautions which science can suggest, the miner's occupation becomes more and more perilous, and the unseen forces which hourly threaten his existence more and more ungovernable. It is consolatory to know that such an impression is not confirmed by statistics. The total number of violent deaths in coal mines, arising from explosions of fire-damp, falls of coal from the roof, accidents in shafts, or miscellaneous casualities, has rather diminished than increased during the last ten years, and is much smaller than it was, in proportion to the quantity of coal raised. Still, it amounts to nearly 1,000 annually, and it is to be feared that for the present year the aggregate returned will be much higher. The loss of life at Barnsley alone is equivalent to that in a pitched battle, and as married men are far more numerous among miners than among soldiers, the misery entailed by it on wives and families is probably much greater. It would be worse than vain, with our present information, to form any conjecture as to the cause of this awful calamity. We can but lay before our readers in a connected form such facts as have come to light, awaiting the results of the inquiry which must forewith be instituted, though under the great disadvantage that few eye-witnesses survive. It was about 1:30 o'clock on Wednesday afternoon when the pit exploded, and it is stated that nearly 400 men and boys were then working in it. About 25 had been saved up to 4 o'clock, and no efforts were spared in attempting to rescue the rest. Throughout the night relays of men continued to descend the shaft, and succeeded in bringing to the bank 70 or 80 bodies, of which all but a few were corpses. One party which had ventured down reported that no less than 38 dead bodies were lying within a space of some 30 yards, and it was hoped that, as the mine was not yet on fire, all the remainder might be recovered. The south side of the pit, however, had not yet been explored, this being the part from which the blast of fire-damp was supposed to have proceeded. Early on Thursday morning a body of sixteen out of thirty-seven searchers then in the pit, having advanced about seven hundred yards from the shaft, "felt the air sucking," and made the best of their way back. The signal being given, they were hauled up in safety, but on reaching the upper air they were reproached with cowardice by some of their fellows, and a fresh batch of seven got into the cage and were lowered down to continue the search. They had not reached the bottom many minutes before a fearful crash was heard, shaking all the works and neighboring houses, and followed by the ejection of a shower of rubbish from the mouth of the shaft. It now became evident to all that no reasonable hope remained of bringing up any one else alive, yet it is stated that a man named Dawson volunteered to go down once more on this desperate errand. Fortunately, a third explosion put an end to any further sacrifice of life; all persons were promptly warned off the ground, and a consultation was held by the viewers on the spot, at which the Government Inspector was present, upon the proper course to be taken .... By a strange and melancholy coincidence, a similar calamity was reported from Hanley, in North Staffordshire, in the very next column of our impression yesterday. It must have occurred within a few hours of the final explosion at Barnsley, and though it cannot have been equally fatal, since there were but 200 men in the mine, it

seems too probable that half of these will be found dead. We shall not dwell on the heartrending scenes witnessed around the pit's mouth on these occasions, as the cage is drawn up with its freight of dead or living bodies The problem, is to invent some antidote to firedamp, or at least, some method of testing its presence, so as to put the most reckless on their guard. One expedient, of the former kind, consisting of an improved plan of ventilation, has lately been under discussion among some of our engineers; another, of the latter kind, and consisting of an instrument for registering the invisible influence of firedamp, was submitted to the Committee of last session.—*London Times, Dec.* 15

Kansas.

A correspondent, writing from Leavenworth, Dec. 24th, says: The developments which are continually being made prove Kansas to be a State as rich in mineral as in agricultural wealth. Coal has been found in all of the eastern portion of the State, and it has been discovered as far west as Fort Riley. In fact, these formations cover nearly one-third of the area of the whole State. In the width of the State the coal lands have been estimated to extend over a territory 208 miles in length by 107 in average breadth, which gives an area of 22,256 square miles. The extent of the coal regions in the settled part of the United States is estimated to embrace about 150,000 square miles. Thus it will be seen that Kansas contains one-seventh part of all the coal lands of the United States. The coal shaft at Leavenworth, sunk under the directions and calculations of Prof. G. C. Swallow and Major F. Hawn, is, according to all observations, the thickest and best seam in the State. It varies in thickness from five feet to six feet nine inches. This shaft was commenced in 1863. After boring so as to test the verity of the geological calculations, an open shaft eight feet in diameter was commenced, which was sunk 100 feet by August, 1864, after which the work upon this shaft was discontinued until September, 1865. It is estimated by the State geologist that for the present wants of the population coal shafts at Atchison, Leavenworth and Lawrence, by the aid of our various railroads, will yield a supply of fuel which can be easily obtained and furnished at cheap rates. But as population and the consumption of coal increases, coal mines will be sunk in all parts of the 22,000 square miles of the coal measures of the State. This valuable mineral deposit is so abundant that discoveries which have been made by mere accident show that there never was a country better supplied with all that the future can demand, let the population be what it may. A seam of coal six feet thick and one mile square has been estimated to contain 5,000 000 tons of coal, of 28 bushels to the ton; therefore every farm of a quarter section, in the eastern part of the State of Kansas, has under it in this coal seam, 1 500,000 tons. The same statistics give the relative value of coal and wood. One ton of coal has been variously estimated at equalling from one and a half to two cords of good dry hard wood for heating purposes. The former figure shows, then, that 6,000,000 tons of coal are equal to 9,000,000 cords of wood, or an acre of this coal seam is equal to 14,062 cords of wood. If all Kansas (78,000 square miles) were covered by a forest affording one hundred cords of wood to the acre, 551 square miles of the six-foot coal seam, or less than sixteen townships, would equal the whole forests of the State. It has been found, from statistics, that the consumption of fuel, aside from that used by steam engines, is equal to one ton to each inhabitant. According to this computation, Leavenworth would require less than 25,000 tons per annum. Allow this city to cover four square miles of territory, then this coal seam at five feet in thickness will supply 24,000 tons of coal from under its streets and lots, so that the supply, for all practical purposes, is inexhaustible. Geological examinations show that rivers do not affect the strata below, and that coal may be mined under the Missouri river as easily and safely as anywhere else. Reliable persons have stated that there is an extensive bed of ignite coal in the western part of the State, about 155 miles from Fort Riley. It crops out in a northeasterly and southeasterly course, across the Republican, Solomon, Saline and Smoky Hill rivers, and is represented as being formed in a heavier bed than that in the eastern part of the State. Future investigations will determine the extent and value of this discovery, but at present its existence is sufficient to prove that the western part of the State of Kansas is not deficient in material for fuel. Kansas not only, but the whole of the great West, seems to be rich in coal deposits. The Nebraska City *Press* says: "Many of our citizens are aware that Mr. Edward Platner has a mine of coal on his farm two and a half miles southwest of town, and from what Mr. Platner has told us, we believe that he has really a good prospect for coal. He commenced working it last summer, and it improved the further he goes, having gained eight inches in thickness in a distance of ten feet. Some that was taken out by him in the summer was worked by a blacksmith, and pronounced good coal. Work in this mine has been suspended at present, but Mr. Platner is making arrangements to put in the winter in developing it. Enough evidences of coal have been found in other places near town to indicate the existence of extensive beds,

Mining Summary.

Nevada.

The Comstock.—By telegram we learn that the Virginia City *Enterprise*, of Dec. 25, referring to the burning of Dall's mill, says: The ruin is complete, not a fraction of the machinery is saved, and nothing but embers mark the location of the famous Dall mill. The entire value of the mill was $150,000; insurance, $50,000.....The same telegram says: Over four tons of bullion, accumulating in the offices of Wells, Fargo & Co., in Virginia City and Gold Hill, are waiting shipment as soon as the state of the roads across the mountains will permit.....The San Francisco *Mercantile Gazette*, Dec. 8th, says: The mining share market has attracted more attention this week than at any time during a like period within the past six months, and all first-class shares show a marked improvement since our last reference. The substantial character of recent developments in a number of claims, together with the dividends that are being regularly paid to stockholders, are tempting parties to enter the market who have kept aloof for a long time. The cash requirements for the heavy transactions during the past week have been very considerable, the Board alone averaging nearly $200,000 per day. As most of the purchasers are for home account, these balances only change the name, neither augmenting nor decreasing the volume of the money at present in the market. Shares appear to have obtained figures beyond the intrinsic merits of the recent developments in one or two claims; nevertheless, larger dividends are expected from several companies.....No sales of Hale & Norcross during the week; $2,000@2,250 is bid, and $2,500 asked. The 65 per ct. assay value of 3,085½ tons of ore, produced during the month of November, gives the company $175,134 62, equal to nearly $57 per ton, and is the largest monthly yield of this company yet reported. The September returns amounted to $53,363 74.....Savage opened at $1,890, advanced to $1,960, receded to $1,900, then sold at $2,000, and closed at $2,110. During the week ending December 1st, 1,250 tons of ore were extracted; assay value, $52,666—leaving an estimated profit of $26,181 after deducting all expenses. The yield is not so large as the previous week, from the fact that the force of men employed were placed at work other than that of extracting ore. In the upper stations the quality is said to have improved, with no change in the quantity. Winze No. 3 is in fine ore at forty feet below the sixth level. The north drift from the Curtis shaft is now nearly under winze No. 3, and in good ore. It is the intention of the company to make a level connection with the seventh station works from the old shaft, about one hundred and fifty feet distant, for which purpose work in the drift is vigorously prosecuted. Receipts of bullion for November up to this time amount to $225,000. A dividend of $100 per foot was declared yesterday, payable to-day. This company have a surplus of about $50,000, besides between 4,000 and 5,000 tons of ore at the mine, and all expenses paid for mining .....Crown Point sold at $1,035@1,075, advance 1 to $1,300@1,250, and closed at $1,190. The yield of ore during the week ending December 1st has been larger than usual, amounting to eight hundred and thirty-five tons. The vein on the four hundred feet level is said to be improving. The drift east from the four hundred feet level is still in vein matter, and has attained a distance of one hundred and seventy-four feet.....Yellow Jacket sold at $1,125@1,170 early in the week, advanced steadily to $1,450, receded to $1,175, then sold at $1,350, and closed at $1,330. We learn nothing about this mine. No report received at the office in this city as promised. .....Gould & Curry advanced from $500@515 to $600@610, and at the close sold at $650. During the month of November about 5 350 tons of ore were extracted from the mine, or which 2,200 tons were delivered to the Gould & Curry mill, and 2,690 tons to custom mills. The bullion produced during the same period amounted to $124,683 61; in October, $111,321 67. The latest advices from the mine state that the water is being rapidly reduced, and that drifting has been resumed on the lower level. The annual meeting of stockholders takes place on the 17th inst. .....Ophir opened at $215, improved to $290, receded to $210, rallied to $250, and closed at $235. The shaft is now ninety feet below the ninth gallery. In the drift north and east on the ninth level, small bodies of low grade ore have been found.....Chollar Potosi improved from $220 to $250, receded to $205, and closed at $232. The ninth drift in the first station of the new shaft is 296 feet, and has about 250 feet to run to reach the north line; nothing favorable so far. The recent development in the south drift at present is said to be only two feet wide. During the week ending December 1st, 726 tons of ore were sent to the custom mills.....Empire Mill and Mining company opened on Monday at $151@152, gradually advancing to $185, and at the close sold at $220. Belcher advanced from $135 to $190, then sold at $135, and closed at $140.....Imperial fluctuated between $127, b 30, and $131, and closed at $134. The stamped value of bullion received during the month of November is $82,640 48. A "brick" valued at $12,065 is included in the above amount, and is said to be the largest ever made in this State. The October returns aggregated $98,380. A large amount of machinery for the Empire Shaft is now on the ground.....Confidence met with more than usual activity since our last reference, improving from $70 to $97 50, then selling at $85@90, closing at $90.....Overman ruled between $20@16, and closing at $14. Bullion sold at $15@17 50, and at the close brought $16. Sierra Nevada sold at $2@5, closing at $4 50.....The Gold Hill *News*, Dec. 6th, says: This morning the water was hoisted out of the lower level of the Empire mine and operations on that level resumed.....The Bacon mine has again resumed operations.....This morning we were down in the hoisting works of the Gould & Curry. The new pump which is run by a large Corlis engine, is in full operation and works most beautifully. From the size of the engine and the ease with which it seems to do its work, we should think the present machinery would be sufficiently powerful to do the pumping to the depth of twelve hundred feet. The new hoisting engine is almost ready to start up; when it goes into operation it will make the third engine in these works. The engines will probably make a total of 300 horse power. The work of sinking is still going on, and within a few weeks they will doubtless strike the same body of ore found in the Savage.....The Virginia City *Enterprise*, Dec. 13, says: About twenty prominent mill men met at the Yellow Jacket office, in Gold Hill, yesterday, and formed an association for the purpose of detecting and prosecuting amalgam thieves, and also for the discussion of matters connected with the milling interest, and for the furtherance of objects which may be of advantage to mill men. The following officers were duly elected: President, C. C. Stevenson; Vice-President, John Rule; Second Vice-President, Charles Forman; Secretary, F. A. Tritle; Treasurers, John B. Winters. After the organization the meeting adjourned to meet at the same place on Saturday, December 15th, at 1 o'clock P. M., at which time all mill men are requested to attend. This is an organization of great importance, as connected with the future prosperity of this State, and, if by its means any one of the infernal rascals who have infested society and have been turning their attention of late to the robbing of the stages can be caught and judiciously hung, we shall not file our objections to the arrangement. Matters also connected with the milling interest are only secondary to the mining interests, and if properly discussed and good ideas properly carried out, it cannot fail to redound to the benefit of the State at large.

Humboldt.—The *Register*, Dec. 8th, says: Fall & Co. dispatched, by Wells, Fargo & Co.'s express, this week, 1,200 ounces bullion; value, $1,328. Freeman shipped, same line, 600 ounces; value, $641. J. T. Maclean dispatched, by express, from Star, two small bars of bullion: value, $600.....The Shea Mill, under the management of J. T. Maklean, is running on Yosemite ore. One small lot of 4 tons, assorted, gave yield of $1,000. Sagebrush is the fuel used..... Nason has just completed a large refining furnace at the Montezuma Smelting works. A force of twenty men left, a day or two since, for Pine Mountain, to supply coal for these works during the winter..... Uncle Torrey has left us for a brief time—gone to California for supplies, and material for building furnaces. Torrey & Whitmore have commenced operation on the Wheeler Ledge, in Arabia—mineral similar to the Montezuma. They expect to start smelting works some time during the winter.....The New York company, operating on an extension of the Monroe series, has struck an excellent ledge, six feet in width, well cased, the quartz assaying about $100 in gold to the ton.....John C. Fall, agent of the Pioneer and Inskip mill, has made arrangements for a shipment of eight to ten tons of ore from the Gem mine, and an unknown amount from the Essex.....Operations have been resumed at the North Star mine.....At the Essex mine there has been a "strike." At a distance of six hundred and forty feet from the tunnel-mouth quartz feeders with some metal were found, all pointing in the direction of the line of the tunnel; these feeders contained silver sulphurets—until a distance of about six hundred and sixty-five feet in the main ledge, as is supposed (and if not the main must be a monster,) was struck—three feet four inches in width, ore estimated to work about $80 to the ton. The ledge proves to be well defined, is in country rock, admitting of rapid mining. Two men can now take out six tons a day, but it may so harden as to allow not half that success; but, if the richness shall hold good the hardness will be of no obstacle. The metalliferous quartz is diffused throughout the ledge; the rock is not assorted, but will be worked as it comes.....At the Gem mine, eight days ago, the workmen struck a vein of as fine metaliferous quartz as was ever found in the upper prospects. It was in a tunnel, running off a shaft sunk in this quest, and about one hundred feet from the surface. The ledge is full two feet in width, well cased, and standing well up in the angles—everything favoring the presumption that it is the main vein of the mine. The ore is of the class known as the eighty-dollar ore, though it has generally paid more than eighty dollars the ton, taking the whole ledge across, no assorting.....Mining matters are looking better at Winnemucca. L. C. Pease, agent for a New York company, is making times lively up that way. Workmen are engaged in running two tunnels—one to strike the Pride of the Mountain ledge two hundred and fifty

in, and continue to prospect for ledges beyond that point; the other to strike one of the ledges of the Union series at a distance in of three hundred feet. The ore is of an average value of $65 per ton, but on account of base metals does not yield more than half this amount by the ordinary pan process.

Lander.—From our file of the *Reveille*—Dec. 11th to Dec. 15th—we take the following: The greatest depth of the incline shaft on the Florida mine is one hundred and ninety feet, and its first level is one hundred and forty-seven feet below the surface. The average width of the vein is ten inches, and is all pay ore, not an ounce of it being rejected. A late crushing of four and a quarter tons gave a yield of $322 per ton. A subsequent one of five tons yielded an average of $370 per ton. In the level mentioned there are in full view not less than $15,000 worth of the same ore. Thus far there have been neither break nor variation in the vein, nor yet the slightest alteration in its angle of inclination. The mine is owned chiefly by the heaviest capitalists of Wall street, New York city, who, in addition to the ability, have the disposition to bring the mine to full fruit.....There has been a "pinch" in the Great Eastern mine, and these are its consequences: During the month of October, when the mine preserved its wonted full proportions, the Great Eastern sent to the Keystone mill for reduction two hundred tons of ore, which yielded the handsome sum of $27,000, an average yield of $135 per ton. Early in November the vein began to contract—to pinch—and was able to send to the same mill in the whole of that month only one hundred and twenty-three tons, which yielded the sum of $36.000, being the splendid average of nearly $300 per ton. The vein had contracted nearly half its ordinary width, but so highly concentrated was its ore that a quantity about three-eighth less yielded $9,000 more. The Great Eastern vein is peculiarly the "razor blade" of the Reese River district. And yet there are few veins in the country, however great their size, that yield as largely, or pay as handsomely, as this "shoe string."....The Keystone mill will close, after the holidays, for about two weeks. This is absolutely necessary to overhaul and repair the mill, which has been running uninterruptedly for many months.....We learn from Capt. Phillips, Superintendent of the Buel North Star mine, that recent explorations caught the vein unusually rich. He showed us a certificate of assay by J. R. Murphy, of the pulp of one ton of ore reduced at the Keystone mill, which yielded at the rate of $513 of silver per ton. The Captain is pushing down the incline.

Montana.

From the Virginia City *Democrat*, Dec. 6th, we take the following: We learn that the company of which Capt. Busch is a member, and who have erected the finest quartz mill in Montana, have purchased the remaining interests on the Lucas lode, Summit district, for thirty thousand dollars. There are at present more mills in Summit district than in any other locality in the gold regions. We regard it as abounding with quartz of exceeding richness, and that the yield next year will be immense. In fact new discoveries of rich quartz on all the leads are being made daily, and to hold a good claim in Summit district ensures a fortune. Those gentlemen who have been lucky enough to get a foothold at that point, will be the millionaires of the Rocky mountains .....A bill recently introduced in the council to tax Mongolian and other foreign miners, was recently defeated, but the matter is still being agitated as to the Chinese.....We are pleased to notice that the House has granted a charter to a company of practical miners for the purpose of taking the Stinking Water river to a point near Highland. It is needless to enumerate the great results that will accrue to our territory from such an enterprise.....A recent article in the Springfield *Republican*, gives some facts and figures about this young and promising territory. To get to Montana there are several routes in the traveller's choice; one across the plains by way of Laramie: one by way of Great Salt Lake City; one up the Columbia river and across the mountains, and lastly the Missouri river route, which is naturally the favorite. The mines are, of course, the chief attraction. There is but little quartz mining as yet, and probably will not be until the placers give signs of exhaustion. "The gross products of gold for the season have been great; a few have made generous fortunes, and many have done fairly. The luck, like gold, lies in streaks; while many miners have labored in sun and sand all summer, and made scarcely day wages, two men took out a ton of gold, and from one bar in Confederate gulch, fifteen hundred feet by three hundred, on which three companies worked during the summer, a million and a half of gold was taken. This Confederate gulch is regarded as holding the richest gold deposits on the continent. The total product of the territory this year is estimated by the miners at twenty-five million dollars, which," the *Republican* adds, "is probably too high." Apart from its minerals the territory possesses many extremely fertile valleys, and, it is asserted, fine facilities for grazing. Gallatin valley produced this season sixty thousand bushels of wheat .....The Virginia City *Post*, Dec. 7th, says of some newly-discovered gulches. They are located three miles from Indian Creek, and about thirty-five miles from Helena, and comprise five gulches, viz.; Oscaloosa, Fanny Fern, Coates, Smith, and Page. Mr. J. H. Ross is the recorder of the district, which is known by the name of the "Warm Spring District," because it is situated in the rear of Page's warm spring ranche. The gulches are dry, about two miles in length and it is generally four feet to the bed-rock. They have prospected twenty-five and fifty cents to the pan. The discovery was made upon the 26th ult., by Thomas N. Howard, W. B. Coates and L. Smith .....Among the Helena items are the following: Postlewait & Co.'s 24-stamp mill started up Monday, Dec. 3d, on ore from the "Park" mine owned by Jas. W. Whitlatch.....We have for two years, from time to time, spoken of the working of the Whitlatch Union quartz mine, and now take pleasure in noticing the first result, which is to be seen at the National Bank in Helena in the tangible form of a "sweet golden nugget," as we have heard it termed, weighing 292 ozs. 16 dwt. 15 grs., which, valued at $18 per oz., gives the sum of $5,272 80. This clean-up was made in Judge L. G. Turnley's ten-stamp mill from 80½ tons of quartz from the Whitlatch Union, in 5½ days' run. Owing to this being the first run, the yield was not as large as may be expected in future, and it has been estimated that at least $800 were left in the batteries, which, added to the above amount, gives $71 91 per ton. This clean-up is the best yet made in the Territory. The ore was taken from the dump without selecting it, and large piles of the same quartz lie ready for the mill. We have prophesied immense return in bullion from the Whitlatch Union, and our prophesy will be fulfilled .....The Helena *Herald*, Dec. 6th, says: We are informed by Mr. Geo. Burson, just from Lost Horse, and by Major Blake, of Dry Gulch, near this city, that a new dry gulch discovery has been made in the vicinity of "Lost Horse," which promises to be among the best discoveries made in this section of the Territory this season. The surface of the pay dirt is reached at a depth of thirty feet, and prospects 60 cents to the pan. A drain ditch from the bed-rock, it is said, will supply the requisite water for working the ground. Otherwise the dirt can be hauled to Lost Horse. Big pay is expected in any event.....Mr. G. B. Thomas, well known here as an enterprising business man and resident of this city, arrived in town on Monday last, direct from the copper regions on the Muscleshell. Mr. Thomas brought with him some 1,500 pounds of copper ore, from the results of the assay of which a correct estimate can be had of the Muscleshell mines. At the business house of James M. Vivian, on Bridge street, are now on exhibition the specimen ores brought from the mines by Mr. Thomas. These specimens embrace the green carbonite, red oxide, native, malachite, grey, and copper sulphurets. We don't pretend to know as much about ores as either Professor Hodge or Doughty; but be our opinion worth much or little, we are fully persuaded that we do not overrate the Muscleshell ores one whit when we say, they are among the richest ever rung from the bowels of the earth in any country. Average specimens of the several kinds of ore have been placed in the hands of Professor Doughty (resident assayer from New York City for the American Bureau of Mines), for assay. Several days will transpire before the results of his tests are made known; and in the meantime, we so far place in jeopardy any reputation we may have concerning metals as to anticipate the forthcoming assays, by predicting that the green carbonite, on close test, will show 90 per cent. of copper, while the red oxide, malachite, and grey ores will show results varying all the way from 40 to 75 per cent. of pure metal. With such mines developed in our midst, and rich lodes filling the category of precious and base metals being discovered almost daily, who is there to dispute the wide extent and enormous wealth of the mineral country of the mountain.....The "Union" is the princely property of J. W. Whitlatch, Esq., of this city, and is situated on an uneven, rocky elevation of ground, bordering Oro Fino gulch, distant from Helena city about four miles. The enterprising proprietor has already expended in the opening and development of this mine some $40,000, and workmen are constantly employed, day and night, in sinking the several shafts and taking out ore. The incline shaft on what is known as the Discovery claim is 190 feet deep, running with the dip of the rock at an angle of about 40 degrees. At the distance of 95 feet down this incline there is a drift running east 205 feet, and on the same level another drift of 70 feet running west and connecting width claim No. 1, west. The amount of ore taken out of the discovery claim is 500 tons. On claim No. 1, east, an incline 90 feet deep has been sunk, and upwards of 400 tons of ore taken out. On claim No. 3, west, an incline shaft, 146 feet deep, has been sunk down, and a like shaft, 94 feet in depth, is sunk on the east end of the same claim. Over 600 tons of ore have been taken out of this claim. The average width of the lode in Discovery is about 2½ feet; average width of No. 1, east, 3 feet; and in No 3, west, 4½ feet. At the bottom of this incline on No. 6, viz., at the depth of 80 feet, the lode is 10 feet wide, and of excellent ore. In several places on Discovery the lode is five feet deep, and the ore of good quality.....The lode in the several shafts and in the "breastings" as far as made is cased in soft, decomposed granite, with clay in many places separating the quartz from the rock. In descending the incline shaft on the discovery, we carefully examined the lode as we passed down, which showed from one to three feet, and in several places, as high as four feet, in thickness of ore. Following the drift east from this incline 200 feet, we came to a vertical shaft letting a flood of daylight down in the otherwise dark recesses of this portion of the mine. As we passed along this narrow parallel chamber we closely examined the lode, which varied from one foot to as high as four feet in width, the average being about two feet As in the main incline, we could by careful inspection, and the aid of a candle, see the fine gold in the ore in a number of places along the drift, which is quite unusual in lodes ranking among the best in the country. The ore in this part of the vein of the lode contains but a small portion of iron or sulphurets. The quartz is of fine texture, rather hard, and here and there beautifully stained with sulphurets of copper. At some points the ore presents a transparent appearance, and the gold is thoroughly defined through it. In the drift of 70 feet on the same incline the ore shows from one to three feet in width, and about the same character as along the drift lower down. It is nearly free from base metal, with the exception of a small quantity of galena and copper. The gold is easily extracted, requiring only the cheapest and most simple process now used to obtain the largest per centage of precious metal. Judge Turnley's mill, in Grizzly Gulch, is now at work on the Union quartz, his contract being to crush 1,000 tons of ore. Mr. Hendrie, whose splendid mill of twenty-four stamps, located in Grizzly Gulch, is now completed, has a contract from Mr. Whitlatch to crush seven months from the Park and Union lodes, and he will commence work immediately. With a mine worth a million of money, it is a humiliating fact that the proprietor of the "Union," after an expenditure in the development of his lode of upwards of $40,000, experienced during the past summer the utmost difficulty in raising money sufficient to feed and pay his workmen.

New Mexico.

The second annual message of Acting Governor Arny, delivered Dec. 1866, to the Legislature of New Mexico, contains the following: The mineral resources of New Mexico are scarcely known or appreciated, and will not be until the Indians are subdued and placed upon reservations so that the explorer and miner can with safety investigate the vast mineral deposits which are undeveloped in our mountains. Gold is known to exist in some twenty different localities in this territory. It and silver must have been known and extensively mined by the Aztecs as the presence of their old ruins is said to be an almost unfailing indication of mines. The Spaniards mined gold, silver and copper in this territory, and Jesuit priests more thoroughly prospected it than it has been since. They report at all points great riches, and the existence of all the precious metals. At Pinos Altos quartz gold mining received considerable attention. Thirty lodes were discovered, paying from $40 to $200 per ton. The richest of these was the "Masten lode." At one time some thirty arrastas were at work and paying well, but the Indians compelled the abandonment of the work. In the Pinos Altos district thirty lodes of gold quartz were worked, ten of silver, or a combination of silver and gold, and three of copper. There has been picked up in one day in a gulch at Pinos Altos ores of gold, silver, lead, zinc, magnetic iron and plumbago. Gold placer mining was quite successful before the war near Fort Stanton. It has been found in seven localities in the Sacramento mountains. At the San Jose mines, in the Sierra Madre, gold quartz was extensively mined by the Spaniards and afterwards by the Mexicans. The quartz veins here intersect each other in all directions, forming a net work of veins for one mile in width and three in length; the surface is dotted with shafts. On the San Francisco river gold, silver, copper and quick-silver have been found. Gold prospected in the bed of the stream from one cent to one dollar per pan. On account of the dangers from Indians no further prospects have been made on this stream. Specimens of the gold found by Capt. Walker and his party on this stream, and which are very fine, are in the cabinet of the Commissioner of the General Land office. Gold placers are found throughout the mountains in this territory, on both slopes, but water is scarce. Gold bearing quartz has been discovered near Fort Davis, Texas. On the Mimbres river, or rather on the side hills in the vicinity of that stream, is an extensive placer—the Mexicans formerly worked it, carrying the dirt to water. A canal a few miles in length at this point, I believe, would develop an extraordinary rich gold deposit. The mines in the Placer Mountain, about thirty miles from Santa Fé, in former years have been productive. The Ortiz and Cunningham mines, gold bearing quartz in this mountain, have been worked for a number of years previous to the late war. When the Texans invaded New Mexico, there were about forty Americans at work in these mines, and in a run of the mill for twenty-four hours, they obtained about $750 worth of gold. There is also near these shafts a coal mine several feet in width, and a short distance therefrom an extensive deposit of magnetic iron. I have some fine specimens of gold from this mountain which indicates its value. These mines have not been worked much since the rebels drove the operatives away, about three

years ago. At Pinos Altos some three hundred miners were at work in placer mining, gold quartz, and silver mining, and this new district was bidding fair to be the first in richness on the frontier; new lodes were being discovered daily? Shortly after the war broke out the Indians combined to destroy the town of Pinos Altos. They made the assault in broad day some six hundred strong, and having surprised the population, they charged through the town, and the inhabitants owe their salvation to a mountain howitzer. At San Jose a small force was engaged in quartz mining. Several companies had been organized belonging to parties from New Orleans. At the commencement of the war a placer had been discovered in the "Sierra Capitan," where some three hundred Sierra miners, chiefly Mexicans, were at work and doing well. Other companies were about to commence operations on the silver lodes of the Organ Mountains. The Stephenson company had shipped a lot of machinery and material to work extensively on the Stephenson silver mines. They reached their destination the very week hostilities commenced on the frontier. This includes the mining operations at the commencement of the war, and these were at different points in the territory: other points had been prospected, and the precious metals are known to exist in abundance throughout the whole mountain portion of the territory. Silver is the prominent and most abundant mineral of the territory, and the lodes of silver, with its many combinations, are the most numerous. I think it will be the most profitable branch of mining in this Rocky Mountain region. It would be too tedious to specify the different localities where silver has been found, as these localities would be numberless, including almost every mountain chain in the territory. The principal districts known, are the Placer Mountains, near Santa Fé, the Organ Mountains, near the Mesilla Valley, and the Sierra Madre, near Pinos.

Altos.—The Organ mountains are extremely rich in silver; over fifty mines have been discovered, the ore being generally argentiferous galena, admitting of a simple reduction by smelting, the mines paying from $40 to $200 per ton. The district near Mesilla valley, in the Organ mountains, has a mean altitude of 4,400 feet, and is intersected with ravines, affording most favorable opportunities for horizontal drifts in opening the veins. There is a belt or series of veins containing six principal veins and many smaller ones, the six larger veins varying from two to fifteen feet in width. On the largest of these veins is the celebrated "Stephenson" mine. This belt of veins crosses the Organ mountains at or near the San Augustine Pass, and both sides of the chain of mountains present similar features and equal richness ..... The country bordering on the north portion of Chihuahua is a rich silver district. Just over our line are the mines of "Corralitos," the most successful mines in the State of Chihuahua. It has been mined for forty years, in the worst Indian country of this section. Its productiveness has overcome all obstacles. It now employs several hundred hands. Near the old town of El Paso tradition places the locality of one of the richest silver mines known to the Spaniards. Its site has been lost since the expulsion of the Jesuits. It is said that the Jesuits of Northern Mexico were the last to suffer the effect of the decree of expulsion, and had sufficient notice of the edict, and carefully covered up the traces of mining, and placed the Indians under oaths and vows with most terrible penalties, not to discover the whereabouts of the mines, telling them they would again return in power and glory. In this way the localities of many of the richest mines of Northern Mexico have been lost. Before the war two copper mines were extensively worked—the "Santa Rita" and the Hanover"- turning out about twelve tons of copper per week, and employing jointly about five hundred hands. Other copper mines have been opened, and were about to commence operations. A copper mine has lately been discovered a short distance from Fort Union; the specimens indicate it to be a rich deposit. The locality of this discovery will render it very valuable, as it is convenient for the return wagons from Santa Fé and Fort Union to the Missouri river. Since the passage of the law of this Territory to secure titles to mining discoveries, a considerable number of gold, silver, lead, copper and platinum deposits have been recorded. It is now all important to the people of the Territory and also to the general government that a geological survey should be made of our mineral regions. Notwithstanding the knowledge which some of our citizens possess of the vast mineral resources of our Territory, this knowledge has not extended beyond our own limits to induce capital hither to develop the rich mineral deposits. This information can only be given in a reasonable time by a geological survey by some competent person. In the States there are large numbers of scientific gentlemen fully competent to perform this important work, and I have no doubt that one or two of these gentlemen might be made available if your honorable bodies would by memorial or otherwise, call the attention of the general government to this important subject—important not only to your constituents, but also to every State in the Union, as well as the general government itself. If the government could be induced to extend to us the necessary said to secure the developing of the various rich minerals so abundant in every mountain south and west of the Raton range, they would in a few years be able to pay every dollar of the national debt in metallic currency.

Georgia.

A correspondent writing from Ackworth, Dec. 18th, of a recent trip made through the Georgian gold belt, says: The belt itself extends in an irregular shape from the upper boundary, where Georgia adjoins North Carolina, in a southwesterly direction across the State, and disappears in Alabama. This belt is the southern extension of an immense zone, stretching along the eastern side of the Blue Ridge from Maryland through Virginia, North Carolina and East Tennessee into Georgia. It is composed of ancient silurian slates, which, thrown up and tilted from their original horizontal line of deposit, now dip, almost vertically, to the southeast, having a uniform course from northeast to southwest. They are almost devoid of fossils, but are very interesting as being highly metalliferous Iron, copper, lead, silver and gold are found throughout the zone, though of course, in varying quantities. The peculiarity that will at once impress any man familiar with other mineral regions of the country is the great variety of true fissure veins. In Mexico, California, Arizona, Nevada, the Rocky Mountain country and so on all across the land to the Atlantic, the ruling form of deposit is fissure veins in eruptive rock. But here a vein crossing the course of these slates is almost unknown. The slates are talcose, micaceous, chloritic and hornblendic, lying in parellel strata and carrying their mineral contents either desseminated in the slate rock or in a matrix of quartz. This quartz occurs not, as usual, in veins cutting across the country rock, but in kidney-shaped masses, interlaced (or, to put it plainly, sandwiched) between the slates. Occasionally true veins may be found traversing the country rock, but they are curiosities. Some of these quartz intercalations are so large (varying from three to fourteen feet in width) that they at first deceive the cursory examiner, and try to pass for veins. But development, in extension or in depth, soon shows them narrowing on all sides, and the vein quickly "peters out." This, of course, would be fatal to any idea of reliability, were it not that as one mass of quartz gives out it is succeeded by another of the same character. So that one cannot count on following the same vein for any length of time, yet, if he chances upon an auriferous zone in the slates, with gold impregnating the lenticular masses of quartz, and disseminated also, as it generally is, through the slate rock between the quartz, he may be sure that the general character of that zone will continue. Here and there, it is true, are found spots—"rich streaks"—in the slates which soon give out entirely. But where the strata are interspersed with these quartz intercalations, the length and breadth of the auriferous zone can easily and surely be traced. It will probably require a different style of mining to open up these deposits, for while their soft, friable character is eminently favorable for crushing and milling, it makes a difficult mining ground for deep working. So that undoubtedly the open cuts and hydraulic sluicing, by which the Californians work their hilly surface deposits, will come into vogue in Georgia to open up the ground and concentrate the ore for milling. The general remarks I have made above will apply to the mineral lands we saw throughout, though there were of course local variations. For instance, we started in White county. Here, (as everywhere, indeed,) we found much surface washing going on—some with the pan, some with the sluice box and "Long Tom." Wherever there is plenty of water there seems to be gold enough to pay for washing. Besides that, in the surface dirt, the gold here occurred in talcose and micaceous slates and in the quartz intercalations. In Lumpkin county is situated Dahlonega. The surface washings hereabouts are very extensive, one company having spent many hundreds of thousand of dollars in bringing in water for a grand washing operation. Besides that, another company has been chartered for the purpose of "fluming" the Chestatee river, as they did the American river in California. By turning the water out of its original channel, they expect to take much gold from the sands at the bottom. The river drains a rich country, and there seems no reasonable doubt of the value of the enterprise I believe they have leased thirty miles of the river to operate in. The mines hereabouts are of the same general character, only here we found also an occurrence of gold as an impregnation directly in the hard chloritic slate as well as the more ordinary styles. A little southwest of Dahlonega sets in a zone of what is called Itacolamite, a coarse-grained, sandy quartzite, colored and largely accompanied by oxyde of iron. In depth, the oxydized metal gives way to the sulphurets, which are very common as the gold matrix, both in the quartz and the slates. Passing into Cherokee county, we began to find the quartz intercalations more evenly distributed, varying from two inches to three feet in width, lying in zones of from one foot to thirty feet wide, carring gold throughout, at different average rates, from to twenty or thirty dollars per ton. In this section we frequently found in quartz the cubic holes once filled by the pyrites now occupied by most exquisite crystals of pure sulphur, gold often being in the same cavities. None of this rock carries much visible gold, but the miner feels more confidence in a brown, rotten-looking, tabular rock, that crushes easily, and "pans" well, even if he can see nothing beforehand, than in the beautiful, pure, white, silex, which bears rich specimens, but is apt to be cocketty, with large barren places between. From Cherokee we went into Cobb and Paulding counties Here the slates grow harder and pass into a mere hornebleudic character, while the quartz partakes of the growing induration; but still the auriferous belt continues, and no doubt in time the whole section will be properly opened up, and become a source of steady revenue to the people, the State and the country. I shall indulge in no wild prognostications nor extravagant statements; but I believe Northern Georgia to be a country full of promise for the future. Her people are anxious, very anxious, for a settlement of their political status. They need, and they cordially welcome, Northern help, brains and capital. Their gold fields are worthy of a well-considered, well-sustained development, and will make ample returns—not to "wild cat" speculation, but to business-like investment of money and mind.

Colorado.

Governor Cummings, in his message to the Legislative Assembly, delivered Dec. 10th, says: The mining interest, which is the basis of all the business life in the territory, is recovering its former prosperity. The blight which has fallen upon it, in consequence of the spirit of speculation that had been encouraged in all quarters, has, to a great extent, been removed, and the increased confidence and activity noticeable in the mineral regions during the past few months, is abundant evidence, if evidence were wanting, that the regular pursuit of mining as a business is far more profitable to the community than the effort to effect speculative sales of property. For, however advantageous it may be to individuals, to dispose of undeveloped claims, at large prices, to Eastern companies, the general mining interest suffers by every such transaction. Frequently so large an amount is expended in the purchase of the property that but a small sum, comparitively, remains in the hands of the company to be used in working their lodes, and, in many cases heretofore, the difficulties and expense necessary in the erection of proper machinery have appeared so formidable that the purchasers never spent a dollar in the territory on their claims, preferring rather to lose what the property originally cost them, than to make further investments. These remarks are applicable, not only to bogus claims—in the sale of which every mining country suffers—but to the sale of properties which are beyond doubt rich in minerals. On the contrary every dollar which is expended in actually developing the mines—in the erection of machinery—in experiments on new processes—even though the experiments should only partially succeed, or wholly fail—adds so much to the material wealth of the community, and aids every branch of industry. Each failure makes eventual success more certain, and brings nearer the day when the difficulties encountered in working the ores shall disappear, and the patient, persistent, and intelligent efforts of the miners be crowned with a great reward. In this view, the condition of the mineral interests of Colorado appear to me far more satisfactory and encouraging than they were a year ago. The law passed by Congress in relation to mineral lands, in response to appeals from the various mining regions, though not all that could be desired is yet so efficient in its provisions as to secure very beneficial results, by inspiring the miners everywhere with the utmost confidence in their titles, which now have the authority of Government for their security...

The Central *Times*, Dec. 19th, says that in the previous week there had been nine lodes discovered and recorded..... It also gives a list of recorded sales of mining claims from Dec. 5 to 14, as follows: R. A. Abbott *et al.*, ceded to Isaac A. Hatch *et al.*, 800 feet on the Abbott lode, Russell District, for $7,000. Co. Supt. Schools deeded to Geo. F. Wanless sundry "school" claims on undeveloped lodes, for $580 00. J. H. Davis deeded to C C. Welch one half of east half of discovery claim on Virginia lode, Gregory District, for $500 00. W. Hepuer *et al.*, deeded to H. Briggs sundry claims in Quartz Hill and Russell Districts, for $1,000 00. Prothrow and wife deeded to the Colorado Central G. & S. Mining Co., of Lyons, Iowa (for $25,000 00 cash down), the one-sixth of four claims on the Northrop lode, Nevada District, and the two-third of five claims on the Old Bullion lode, Gregory District. Wm. and Asa Shepherd deeded to the same Co. (for $14,000 00) sundry feet on the above two lodes. And same day, P. E. D. Loye and Geo. Lohr deeded to same Co. sundry feet on the above lodes for $12,000 00. All these were real cash transactions, showing that the value of our mines are appreciated *at home*.....The same paper says: The other day, when at the County Recorder's office, we saw a deed of very huge proportions. It was made from Jas. E. Lyon *et al.*, to the Consolidated Gregory Co., for $625,000 00, a stock transaction or transfer of the property known as the Lyon Smelting Works, No. 4 east, on the Bates, and other scattering claims. The colossal sheet of scrip seemed like a boy that had

the small-pox badly—there being $625 00 worth of revenue stamps pasted like postules all over it..... The Rocky Mountain National Bank (Kountze & Co.) will ship to the east to-morrow 594 ounces. Messrs. Warren Hussey & Co. will ship 450 ounces, and Messrs. Geo. T. Clarke & Co. 100 ounces. Currency value of all $22,000 00.

Chili.

A correspondent of the *Herald* writes from Coquimbo, Nov. 25: Coquimbo is the principal port of the copper region and province of the same name. It is a new town, having sprung up within a few years as a port for shipping copper. It is perched upon the side of a rocky ledge, and, with the exception of the front towards the sea, is surrounded with an unbroken waste of volcanic stone and sand. A telegraph connects it with Santiago, one railroad with the immense copper-smelting works of Guayacon, another with the copper mines of the interior, and the third with the handsome city of Serena, capital of the province. The whole range of the Andes is known to be filled with precious metals of incalculable wealth. All along the coast, for four thousand miles, are mineral indications visible to the naked eye, and in some places the tourist sails many days past bluffs deeply stained with the deposits of copper. At every port mineral specimens from the interior are exhibited for sale, and to induce explorations; and small smelting works dot the shores from Peru to far south of Valparaiso. The traditions of the Indians whom the Spaniards found here nearly four hundred years ago, were full of accounts of gold and silver mines, and from that time to the present day new discoveries have followed each other with almost fabulous rapidity. It would be impossible to give all the traditions that still exist respecting mines that have once been worked by Indians on a small scale, and are now unknown. The authenticated accounts of accidental discoveries by peons, who either parted with their acquisitions for a trifle, or suddenly amassed immense fortunes, would fill volumes. In the coal mines in the south of Chili I saw men working with the pick who once owned portions of the coal district, and many of the copper and silver mines now in operation have laborers employed in them who knew of the existence of the mines long before they were opened. A few lucky discoverers turned their good fortune to account, and from paupers, became very wealthy. I know of one instance in particular, where the owner of a mine was formerly a half-starved peon, glad to get ten cents a day, and who now has an annual income of $200,000. Gold and silver, in more or less abundance, are found from the Isthmus of Panama to the Straits of Magellan. The silver mines of Peru have long been well known, and the discovery of silver in Chili dates back to a very early period. Gold is found in many parts of this country, and has been worked some, but not with satisfactory results. It is believed that the extreme southern district of Chili, now occupied by Indians, has very rich gold mines, as considerable quantities of that metal reach the coast through the hands of traders with the various tribes. Near Valparaise several attempts have been made to get out gold, and one or two parties did tolerably well for a time, but the project was finally abandoned. Immense mines of silver and copper are found in Bolivia and the north of Chili, and farther south are rich and extensive coal fields. Mines of cobalt, zinc, lead, &c., have also been discovered, and are being worked successfully. In addition to these mineral riches, a portion of the coast yields many tons of saltpetre annually. In the Cordilleras have been found indications of petroleum like those in the oil region in Pennsylvania. Travellers between Chili and the Argentine Republic report the existence of large pits of petroleum on the eastern slope of the Andes, and there is no doubt that time will develop an oil region in this part of the world, compared with which that of Pennsylvania will sink into insignificance. The only question is, when and how are these riches to be developed? Most of the mines, as well as the oil regions, are many leagues in the interior, far up on almost inaccessible mountains, and distant from water and vegetation almost hundreds of miles. To reach them, it is necessary to make a slow and painful journey through deep sand and over dangerous mountains, carrying food and water precisely as do the caravans in the Great Sahara; and in many cases where the mines are within a few hours' ride of the coast, the precipitous heights and cost of living render the expense of getting out the minerals much greater than the value of the metals themselves. Until the last few years, all the mines were worked in a very superficial manner; but foreign engineers, aiding native enterprise in a few instances, suddenly gave a new direction to mining operations, and from comparatively unremunerative surface, working miners struck down into the earth, and commenced taking out its riches by millions. Steam engines were brought from the United States and Europe, cart roads were built at great expense, and finally railroads were constructed, connecting the seaports with mines far up among the mountain peaks. The Tamaya mines are the largest copper mines in the world, and are an imperishable monument to the energy and ability of their principal owner, Don José Tomas Urmeneta. I passed several important mines on my way from Coquimbo to Tamaya, and had heard great stories of the extent of this famous place, but I was unprepared for the magnitude of the operations I found going on up above the clouds. On the morning of the 20th I started from the table lands above the Limari valley to climb the Tamaya Mountain. From its base the mule-path winds in a zig-zag fashion up among immense volcanic rocks and along precipices, down which a misstep would hurl one to destruction, until it is lost to sight in the mists which hang about the peak. The ascent was slow and tiresome. There are nearly ten thousand persons living on the hill, and from the heights above the figures moving along its sides, dwarfed by distance and comparison with surrounding objects, appeared like pigmies. Strings of packed mules going down laden with copper ore, and coming up laden with various freights or empty packs, straggled along like ants busy with the discovery of a new supply for their winter store, and the carts down on the Tongoy road seemed to have no more motion than fishing boats when the wind and tide are still. The whole mountain is honey-combed wich shafts and galleries, and its exterior covered with heaps of blue ores too poor for transportation. In some of these piles are hundreds of thousands of dollars, but at present it is too expensive to work such a low class of ores, and these are left for future operations, when the railroad is opened. The mountain is 4,200 feet high. Five hundred feet below the summit, on the eastern side, the copper makes its appearance on the surface, the lode running north and south, and dipping to the west at an angle of fifty-two degrees, with an average thickness of seven feet. In many places the lode is twenty-one feet thick, and contains fifty per cent. of pure copper. The hill is divided among various individuals, who are mining with different results, according to the extent of their machinery and manner of working. The principal mine is called "El Pique," and belongs to Mr. Urmeneta, who lives in Santiago. A description of this one will suffice for all in general, and will give an approximate idea of how our copper is obtained. After rambling about the vicinity of the mines for a couple of days, I put myself in the hands of the manager, Mr. Charles Green, of Providence, R. I., and went down into the bowels of the earth. Before starting, we arrayed ourselves in miners' costume, a dress that would create a sensation in Broadway, and were provided with well filled lamps, swinging on the ends of rods about three feet long. The entrance to the mine is on the parapet formed by slicing down a part of the steep hill side, and on which are the residence of the manager and the machinery and shops of the establishment. Entering a tunnel about seven feet high, and extending into the heart of the mountain, we soon came to a large, arched chamber, in which are the boilers and engines for hoisting ores. Following the tunnel three hundred and fifty yards, we came to the main shaft, and descended, by means of ladders, down through the various galleries or levels, at the extremity of which miners were at work, until we reached the bottom of the mine, over one thousand feet perpendicularly under ground. Here we travelled through various long passages, in some of which it was necessary to creep on the hands and knees. The air was cool and sweet, owing to the excellent arrangements for ventilation, and most of the passages were perfectly dry. Water is found in some of the shafts, but not in quantities sufficient to interfere with the work. It was hoped that more water would have been discovered, as it would prove a valuable auxiliary in reducing the ores. As we passed along the chambers, we met men and boys stripped to a breechcloth, carrying rawhide bags of ores to the hoisting shafts, and occasionally the dull report of a blast would rumble through the mines like distant heavy thunder. In some places the ores were so rich that they glistened in the light of the lamps, and seemed to realize the tales of the wonderful caverns filled with gems. Over four hours were spent in the mine, although we did not go through one-third of the passages, there being over ten miles of galleries already open and in good working order. The ascent was very tiresome, the legs inclining to give out after climbing two or three hundred feet of ladders. Generally visitors to the mines are lamed for a few days, and in some instances individuals have been laid up for a week, suffering acute pain in the muscles of the thighs. The ores, upon being brought to the mouth of the mine, are picked over by women and boys, and passed through powerful crushers that reduce them to fine particles. In this shape they are washed by machinery, for the purpose of removing all foreign substances, and transported in carts and on pack mules to the coast for shipment abroad. Very few of the miners in Chili undertake the crushing and washing process, but transport their ores to the nearest smelting furnaces. At the Tamaya mines the poorer ores and the refuse after washing the metals, are all saved, to be smelted when the railroad is opened, and coal can be brought to the spot at a reasonable expense. Mr. Urmeneta commenced his mining operations at Tamayo in 1834, when he took up two claims on the copper lodes. Other parties were also working in the same hill at that time, and with a forethought which every one ridiculed at the time, Mr. Urmeneta commenced sinking a shaft back of the other miners. As the lode dips at an angle of fifty-two degrees, his perpendicular shaft finally struck the metal behind the claims of his competitors, thus cutting them off from further progress, and giving him control of the whole mine beyond a certain point. This shaft was sunk through hard porphyry, and took ten years in its accomplishment, exhausting Mr. Urmeneta's fortune of several hundred thousand dollars, and heavily involving him in debt. As soon as he reached the copper, however, he commenced taking out immense quantities of very rich ores, and since that period his mine has annually furnished about 180,000 quintals of ore of twenty-five per cent. of pure copper. He built a cart road up to the mine at an expense of $80,000, and erected steam engines, workshops and dwelling-houses, where it seemed impossible for a foothold to be obtained. Now there is a busy little town, a handsome church erected by Mr. Green, and almost every convenience for comfortable living. The magnitude of this work can only be appreciated by those who have travelled across the sandy desert between the coast and Tamaya, climbed the barren mountain side, and seen the precipices over which the ponderous machinery and other paraphernalia of mining have been borne. Three new tunnels are being run into the southern base of the mountain, the second one six hundred feet above the tires, and the third three hundred feet still higher up. These are far below the present entrance to the mine, and when complete, will enable the ores to be taken out on cars at the bottom, instead of hoisting them hundreds of feet to the opening now in use. One tunnel will be a mile, and the other a mile and a half in length, extending most of the distance along the copper vein. The principal advantages to be derived from these tunnels, are that they will not only facilitate the taking out of copper in the lode above them, but they will form new levels from which to go down hundreds of feet still further in the copper, with the same ease that the higher portions of the lode are worked from the first upper level opened thirty years ago. The railroad now rapidly approaching completion will pass near the mouth of these tunnels, at which point furnaces are to be erected for smelting the poorer class of ores, of which there are now millions of dollars' worth, heaped upon the side of the mountain near the entrance to the several mines. The riches to be taken up from this mine hereafter can scarcely be computed. It must be remembered that the copper lode runs through the hill like a slice of ham in a sandwich; that it averages seven feet thick, and twenty-five per cent. of pure copper; but that, as it rests like a steep roof, no one can tell to what depth it may extend. Most of the principal men connected with the working of this mine are Americans. Mr. Green has been engaged thirteen years in developing it, and as manager, has under his control about a thousand men. The chief engineer is a young Baltimorean, Mr. J. G. Heisler, and Mr. S. Fulton, another Baltimorean, has charge of the three tunnels being run in at the southern side of the hill. The San Jose mine, adjoining this one, and next to it in importance, is under the direction of Mr Waring, also an American. The railroad in process of construction from Tongay to the mines overcomes obstacles never before successfully met in railroad engineering, with the solitary exception, perhaps, of the Mount Cenis road, in Europe. The grade on this road is five per cent., or nearly 300 feet to the mile, and the curves are of 180 feet radius. It climbs up along the mountain side in places so steep that the workmen cannot go outside the excavation they are working, and where immense masses of overhanging rock are to be removed without endangering mining establishments. From the table land below Tamaya, a branch road will be run up through the Limari valley to Ovalle, and probably, in a few years, to rich mines recently discovered some distance further in the interior. There are hundreds of mines yet to be opened in Chili, which are at present too remote for profitable working. The following statistics show the amount of copper exported from Chili and Bolivia for the quarter ending June 30, 1866. This amount is much less than that of previous years, owing to the Spanish difficulties, which have sadly interfered with all branches of business on the coast. Copper exportations are now, however, on the increase, and promise to soon exceed that of seasons before. A considerable amount of new mining machinery is now on the way here from the United States, and as the opening of numerous additional mines is only a question of time, there is little doubt that in a few years the amount of copper from South America will be more than doubled. Railroads are needed to promote this end, and a number of lines are now under contemplation. In some parts of Chili and Bolivia, pure copper is found resembling that of the Lake Superior mines, and in other places in a form like fine sand. The latter class is called barrilla, and is found on or near the surface of the ground, but so far in the interior that pack mules cannot be used profitably in transporting it across the deserts which intervene between the copper and the coast. Copper exports from Chili for the quarter ending June 30, 1866:

	Ores, &c. *Quintals.*	*Fine Copper.* *Quintals.*
To England	329,344	182,612
To France	———	18,011
To United States	42,440	15,000
To Germany	———	1,286

Exports from Bolivia:

To England	380,049	191 397

This makes a total of copper exportation from the two republics, for the quarter, of 441,786 quintals of ores, &c., and 225,694 quintals of fine copper, a decrease from the amount for the same quarter of 1865 of 91,819 qu'ls. ores, &c., and 71,022 qu'ls. fine copper.

Resources of California.

During the first nine months of the past year, says a San Francisco paper, there was exported from California 24,583 flasks of quicksilver, worth $1,000,000, besides retaining as much more for home consumption; 20,000 tons of copper ores, valued at $1,000,000, and $34,869,705 in gold and silver—a total export during nine months of $46,841,584, all produced by not more than 200,000 workers; for out of a population of 400,000, one-fourth of whom are children, it is not an overestimate to calculate that there are 100,000 females and non-producing adult males.

GOLD.

COMPANY.	SHARES.	STOCK.	SITUATION OF MINE.	SECRETARY & PLACE OF BUSINESS.
Acadia			Nova Scotia	H. W. Nelson, 24 City Ex., Boston.
Ada Elmore	200,000	$2,000,000	South Boise, Idaho	B. Lawrence, 157 B'way, N. Y.
Amber	300,000	300,000	Greene Co., Penn	Geo. W. Grove, 276 S. Third, Phil
Albion		300,000	Halifax, Nova Scotia	H. W. Nelson, 24 City Ex, Boston
Alps	100,000	250,000	Illinois Central Dist., Col.	J. Stanton, Jr., 25 Nassau, N. Y.
Ascot	50,000	5,000,000	Sherbrooke, Canada E.	G. H. Morrison, 17 Nassau, N. Y.
Atlantic				
Atlatic & Pacific	50,000	5,000,000	Humboldt T., Humboldt co.	J. N. Sewall, 8 Broad, N. Y.
American	100,000	5,000,000	Gregory Dist.	
American Flag	60,000	600,000	Nevada Dist., Col.	H. Foles, 71 B'way, N. Y.
Astor	200,000	1,000,000	On Comstock Lode	J. Chapman, 71 Broadway, N. Y.
Baltic			Colorado	New York.
Bates & Baxter			Colorado	New York.
Bay State	200,000		Colorado	Lem'l Bangs, Boston.
Benton	100,000	500,000	Colorado	F. W. Capen, 44 Ex. Pl., N. Y.
Black Hawk	50,000	5,000,000	Gilpin co., Col.	D. Littlejohn, 81 John, N. Y.
Beacon		500,000	Halifax co., Nova Scotia	J. B. Post, 20 Ex. Pl., N. Y.
Bobtail	100,000	1,000,000		J. Stanton, Jr., 25 Nassau, N. Y.
Briggs	10,000	1,000,000	Gilpin co., Col.	D. Littlejohn, 81 John, N. Y.
Bradshaw	250,000	1,000,000	Yavapai County, Arizona	O. H. Conover, 219 Dock st., Phil.
Burroughs	100,000	1,000,000		L. Bangs, 22 Pine, N. Y.
Bullion	200,000	1,000,000	Bannock, Montana	69 Liberty, N. Y.
Bullion Consol.	300,000	300,000	Summit and Clear Creek, Col.	J. P. Whitney, 19 Lindall, Boston
Calvin	200,000	1,000,000	Clear Creek co., Col.	
Canada Co				A. Call, 7 Phœnix B'l'g, Boston.
Chem Gold&S.R			Eldorado Company, Cal.	64 B'way
Church Union	240,000	1,200,000		Jesse G. Fitts, 69 Liberty
Chebucto	100,000	500,000	12 miles from Halifax	J. E. M. Gilley, Boston.
Clarendon		500,000	5 miles from Halifax	H. Doane, 41 State, Boston
Chase	5,000	500,000	Colorado	W. E. Lawton, 81 John, N. Y.
Central Gold M.	20,000	1,000,000	Central City, Col.	L. Bangs, 17 Nassau, N. Y.
Central Mining	200,000	1,000,000	Colorado	46 Exchange Pl., N. Y.
Chandiere	100,000	500,000	5,000 A Famine Riv. C. E.	Wm. B. Fowle, Boston.
Cobden	100,000	1,000,000	Idaho	New York.
Colonial				W. S. Ely, 7 Trav'r B'l'g, Boston.
Colorado Boston			Colorado	R. C. M'Laughlin, 40 State, Bos'n.
Colorado N. Y.			Colorado	12 Pine, N. Y.
Coleman			Colorado	New York.
Columbia	50,000	3,000,000	Austin City, Nevada	10 Pine, N. Y.
Consuelo Gold				54 William.
Consol Gregory	50,000	5,000,000	Gregory Dist., Col.	30 Pine, N. Y.
Cook & Kimball	1,000	150,000	Colorado	W. W. Baldwin, 35 Wm., N. Y.
Copalmsho	250,000	5,000,000	Parke co., Col.	J. C. Stocker, 137 B'way, N. Y.
Corrisamnee	100,000	1,000,000	Colorado	New York.
Commonwealth			Nevada	Philadelphia.
Corrydonn	100,000	2,500,000	Gilpin co., Col.	46 Exchange Pl., N. Y.
Continental	20,000	2,000,000	Gregory Dist., Col.	115 Liberty, N. Y.
Central Gold	200,000	1,000,000		L. Bangs, 22 Pine, N. Y.
Dauphin & Colo	200,000	1,000,000	Colorado	John S. McMullin, 423 Walnut, Pa.
Day & Bushnell	300,000	3,000,000	Colorado	T. Chalmers, Jr., 20 Ex. Pl., N. Y.
De Lery		10,000,000	Chandiere Valley, Canada E.	J. M. Winchell, 72 Cedar, N. Y.
Denver	50,000	1,000,000	Gilpin & Clear Creek, Col.	J. Wadsworth, 61 Cedar, N. Y.
Devonshire				W. Stockbridge, 74 Fr'klin, Bos'n
Downieville	300,000	300,000	Colorado	J. C. Harriott, 70 Wall, N. Y.
Dorset			Chandiere River, C. E.	F. McInnesy, 50 Wm., N. Y.
Eagle	100,000	1,000,000	Gold Dirt Dist., Col.	J. P. Davies, 81 John, N. Y.
East Bannack	100,000	200,000	Bannack City, Montana	J. Callender, 18 Ex. Pl., N. Y.
Eldorado	500,000	2,500,000	San A Dist., 9 miles of Austin	208 S. Fourth, Phila.
Empire Mill & M				O. F. Griffin, San Francisco.
Enriquetta			Arizona	New York.
Esperanza		500,000	Star D., Humboldt co.	117 Broadway, N. Y.
Etna	50,000	500,000	Nevada Dist., Col.	C. W. Bryant, Boston.
Excelsior	30,000	300,000	Central City, Col.	J. Weatherbee Jr., 11 P. B'g, Bos.
Fairmount	20,000	200,000	Colorado	John P. Harker, 120 N. 6th, Phil.
Famine Falls	100,000	1,000,000		D. L. Dodge, 80 B'way, N. Y.
Garrison	100,000	5,000,000	Colorado	C. G. Mesier, 29 William, N. Y.
Gem	25,000	1,250,000		H. K. Gates, 191 B'way, N. Y.
Georgetown			Colorado	New York.
Gilbert River				C. F. Jackson, 18 Fhe's B'g, Bos'n
Gilpin				C. W. Gallonpe, 76 State, Boston.
Golconda	250,000	5,000,000	Sherbrooke, Canada E.	A. H. Adams, 19 Broad, N. Y.
Gold Field				C. B. Cowling, 39 Kilby, Boston.
Gold Rock	5,000	500,000	Central City, Colorado	R. M. Lockwood, 115 Wall, N. Y.
Gold Hill	50,000	500,000	Colorado	W. T. Eustis, Boston.
Gold Mountain	600,000	6,000,000	Clear Creek, co. Colorado	25 Nassau, New York.
Gold Min'g of Col	50,000	5,000,000	Colorado	E. Latham, 23 William, N. Y.
Golden Gate	60,000	600,000	Sum., Higil'd & Mill C. D., Nev.	J. Morse, Jr., 117 B'way, N. Y.
Gunnel Central			Colorado	70 Broadway, N. Y.
Gunnel Gold	200,000	2,000,000	Colorado	F. E. Roelofson, 78 & 80 B'way, N Y
Gregory	20,000	1,000,000	Colorado	Thos. Wildes, 17 William, N. Y.
Granada	50,000	125,000	Colorado	J. Stanton, Jr., 25 Nassau, N. Y.
Great Western	60,000	600,000	Russel Dist., Col.	E. Keneys, 70 Broadway, N. Y.
Gunnel Gold	100,000	1,000,000	Colorado	F. E. Roelofson, 78 B'way, N. Y.
Halifax				A. Case, 7 Phœnix B'l'g, Boston.
Harmony				Demas Barnes, 21 Park Row.
Hemit'ge Ranch	20,000	200,000	El Dorado, Cal.	
Home	80,000	2,000,000	Gold Dirt Lode, Gilpin co., Col.	J. P. Davies, 81 John, N. Y.
Holman	150,000	300,000	Gilpin co., Col.	J. O'Neill, 24 Nassau, N. Y.
Humboldt	100,000	500,000	Colorado	78 B'way.
Idaho Gold	100,000		Montana	4 Pine, N. Y.
Isaac's Harbor	100,000	500,000	Isaac's Harbor, Nova Scotia	W. F. Shirley, 137 B'way, N. Y.
Isle Royale				44 Ex. Pl.
Kansas Colorado	100,000	1,000,000	Colorado	J. G. Greenlee, 111 B'way, N. Y.
Kent				G. H. Wyman, 19 Fhe's B'l'g, Bos.
Kip & Buell	100,000	200,000	Colorado	J. C. Harriott, 70 Wall, N. Y.
Knickerbocker	100,000	1,000,000	Colorado	F. Avery, 78 B'way, N. Y.
La Crosse	100,000	$1,000,000	Nevada Dist., Colorado	H. Fales, 71 B'way, N. Y.
Liebig	200,000	$1,000,000	Colorado	
Lake Major	12,000	600,000	Nova Scotia	Fred. Franck, 113 Water, N. Y.
Mariposa Gold	100,000	10,000,000	Bear Valley, Cal.	G. W. Farlee, 34 Wall, N. Y.
Mammoth	50,000	500,000	Colorado	J. Jarrett, 41 Liberty, N. Y.
Manhattan	100,000	500,000	Colorado	W. R. Lothrop, 172 B'way, N. Y
Massachus.	250,000	250,000	Gilpin co., Col.	W. D. Briggs, 11 Fhe's B'l'g, Bos
Merchants	50,000	600,000	Alturas co., Idaho	Jas. K. Selleck, 157 B'way, N. Y.
Metropolitan				
Mountain Pride	100,000	1,000,000	Fr Ck, St. Bse., Idaho	29 Pine, N. Y.
Montague	50,000	500,000	near Halifax, Nova Scotia	C. B. Cowling, 39 Kilby, Boston.
Mount Alpine			Grillith Dist., Clear Ck., Col.	J. B. Randol, N. Y.
Mount Vernon	500,000	5,000,000	Mt. V. & Mam'th Dist., Nev.	25 Park Row, N. Y.
Mount Vista	50,000	500,000		J. Chapman, 23 Nassau, N. Y.
Montana	100,000	400,000	Nevada, Ills., Greg'y, Col.	A. L. Guerber, 54 Wm., N. Y
Monte Christo	100,000	2,000,000	White Pine District, Nev.	Thos. Dunlap, 413 Chestnut, Phil
Montezuma	100,000	500,000	Colorado	F. B. Webster, Boston.
Montrose	100,000	1,000,000	Clear Creek co., Col.	C. A. W. Sibley, 80 B'way, N. Y
Morning Star	5,000	5,000,000	Owyhee co., Idaho	E. M. Barnum, 137 B'way, N. Y
Mexican Pacific	100,000	10,000,000	Mexico	J. Mackie, 88 Wall, N. Y.
Melones & Stan			Calaveras co	606 Mont, San Francisco
National	300,000	3,000,000	on So. Boulder Ck, Col.	31 School, Boston.
Nevada Star				25 Pine, N. Y.
New England	50,000	150,000	Black Hawk, Col.	J. Weatherbee, Jr., Boston
New Mexico			near Santa Fe	
New Gregory				W. A. Kent, 144 State, Boston
New York City	50,000	5,000,000	G'd Canon Dt., Land, co. Nev.	10 Pine, N. Y.
New York Dist.	50,000	500,000	Austin, N. Y. Dist., Nevada	71 B'way, N. Y.
New York of Col	60,000	1,000,000	Colorado	F. E. Roelfson, 74 B'way, N. Y
N. Y. & Nevada	100,000	1,000,000	Nevada	J. J. Osborn, 30 Pine, N. Y.
N. Y. G Min'g.	100,000	1,000,000	Colorado	F. E. Roelofson, 78 & 80 B'way.
N. Y. & Eldor'do	250,000	2,500,000	Nevada	G. H. Munroe, 106 B'way, N. Y.
N. Y. & Idaho			Idaho	180 Chatham, N. Y.
N. Y. & Santa Fe			Nevada	New York.
N.Y. & Owyhee		1,000,000	Owyhee co., Idaho	6 Pine, N. Y.
N. Y. & Oro Fino	10,000	1,000,000	Owyhee co., Idaho	137 Broadway, N. Y.
N. Y. & Reese R			Nevada	New York.
N. Y. & Reefiew				2 Murray, N. Y.
N. Y. & Washoe			Nevada	New York.
North Clear Ck	100,000	1,000,000	Gilpin co., Col.	J. Francis, 80 B'way, N. Y.
N. DeStar G&S Mo	10,000	500,000	Gilpin County Colorado	H C. Ballard, 88 Wash'n st. Chigago
Nova Scotia				Chas. Barrett, 13 Doane, Boston,
N. Y. & Nova Sc	100,000	1,000,000	Tanger, Nova Scotia	Jos. F. Gay, 3 Hanover, N. Y.
National S Min'g		1,500,000	Owyhee co., Idaho	115 B'way, N. Y.
Occidental		500,000	Nevada & Ills. C. Dist., Col.	100 B'way, N. Y.
Oldham				Chas. Barrett, 13 Doane, Boston
Ophir	62,500	625,000	on Comstock Lode, Nevada	Moses A. Hopnock, 45 William.
Pacific	40,000	4,000,000		24 Pine, N. Y.
People's	100,000	5,000,000	Alpine & Sierra cos.	23 Nassau.
Peck				F. R. Sawyer, 144 State, Boston.
Perigo	60,000	3,000,000	Ind. Dist., Gilpin co., Col.	J. W. Stratton, 90 B'way, N. Y.
Pine Mountain	30,000	3,000,000	Pine Mountain Dist., Nev.	F. K. McCully, 157 B'way, N. Y.
Phila. & Color'do	20,000	1,000,000	Central City, Col.	E. W. Clark & Co., Phila.
Phelps & Gilm're	200,000	1,000,000	Colorado	W. H. Steudevant, 25 Nassau.
Pleasant Valley	125,000	1,250,000	Colorado	J. S. Lyon, 69 Wall, N. Y.
Pontiac	50,000	1,000,000	Ill. Cen. M. Dist., Col.	R. H. Rickard, 19 Nassau.
Prescott	100,000	1,000,000	Central Arizona	69 B'way, N. Y.
Quaker City			Ind'l D't. G'd H'l City, Col.	103 South Third, Phila.
Quartz Hill	40,000	400,000	Nevada Dist., Col.	J. A. Tyler, 29 Wall, N. Y.
Ranche Ck	10,200	1,200,000	Pine Wood Dist., Nevada	48 Broad, N. Y.
Realito		1,000,000	G'd Hill D., Storey co., Nev.	117 B'way, N. Y.
Reese River P'l	100,000	1,000,000	Amador Dist., Lander Co., Nev	Elijah Aliger, 67 Wall, N. Y.
Renfrew				W. Stockbridge, 74 F'klin, Bos'n.
Republic	15,000	1,500,000	Amador D., Lander co., Nev.	67 Exchange Pl., N. Y.
Rocky Mountain	50,000	500,000	Grey & Empire Dists., Col.	E. L. Belles, 70 B'way, N. Y.
Reciprocity	100,000	1,000,000	Canada East	B. B. Grant, Jr., 71 B'way, N. Y
Scorpion			Virginia City, Nevada	617 Clay, San Francisco.
Sherbrooke	100,000	1,000,000	Sherbrooke, Canada East	F. Schumacker, Cliff, N. Y
Silas Wright	60,000	600,000	Amador D., Lander co., Nev.	18 Wall, N. Y.
Silver State	100,000	500,000	(Humb't Starr. Pr. R. D. Humb't co., Nevada	R. S. Miller, 49 William, N. Y
Silver Wave	300,000	3,000,000	Reese riv., Lander co., Nev.	Emmet Blair, 243 B'way, N. Y.
Smith & F'rnler	125,000	2,500,000	Colorado	G. A. Lathrop, 4 Broad, N. Y.
Smithfield	100,000	400,000	Gilpin Co., Col.	A. F. Baum 48 Broad st, N. Y.
Spanish		3,000,000	La Plata, Churchill co., Nev.	228 South Third, Phila.
Sn Clear Ck			Colorado	Canastota, N. Y.
Starlight Ledge	50,000	500,000	Pville, El Dorado co.	
Star of Color	200,000	2,000,000	Colorado	J. N. Towers, 22 Pine, N. Y
Standard	50,000	500,000	Gregory Dist., Col.	T. A. Mitchell, 70 B'way, N. Y
Steptor	20,000	2,000,000	G'd Can., Lander co., Nev.	10 Pine, N. Y.
Sterling City		1,200,000	Colorado	New York.
Stewart	100,000	500,000	Colorado	C. Durham, 31 Exchange, Boston
Suffolk				Carlos Cobb, 22 William, N. Y.
Southard				Wm. Wallace, 11 Doane, Boston.
Stafford				C. E. Jackson, 15 Central, Boston
Tascher	100,000	1,000,000	Colorado	F. J. Wright, 8 Wall, N. Y.
Texas	50,000	500,000	Black Hawk City, Colorado	Wm. E. Parish, 155 B'way, N. Y
Trinuto			San Antonio, L. Cal.	San Francisco.
Union	240,000	12,000,000	Colorado	F. A. Potts, 110 B'way.
United States	75,000	1,500,000	Colorado	J. P. Stevens, N. Y.
University				31 Nassau, N. Y.
Virginia City	250,000	250,000	Nevada	J. B. William, 78 & 80 B'way.
Wauba Yuma	600,000	6,000,000	Arizona	25 William, N. Y.
Waddingham	48,000	1,200,000	Alturas co., Idaho	Jas. K. Selleck, 157 B'way, N.
Waverley				J. Leighton, 97 State, Boston
Windsor Gold M	10,000	100,000	Colorado	25 William, N. Y
Wilson & Cass			Colorado	New York

LEAD.

COMPANY.	SHARES.	STOCK.	SITUATION OF MINE.	SECRETARY & PLACE OF BUSINESS.
Anemia	100,000	$ 500,000	Duchess co., N. Y.	G. Furnam, 77 Cedar, N. Y.
Bucks County	10,000	200,000	Bucks co., Pa.	R. B. Sinclair, 53 Ex. Pl., N. Y.
Canada	40,000	250,000	Canada	Alb. Case, 7 Phe'x B'l'g, Boston.
Clute	150,000	550,000	Macomb T. St. Law. co., N. Y.	Bev'l'y S. Merrill, 42 Cedar, N.Y.
Continental	200,000	500,000	Martinsburg, N. Y.	J. Sickles, 37 Ex. Pl., N. Y.
Eastport	100,000	1,000,000	Eastport, Me.	R. Yose, 54 William, N. Y.
Erie	40,000	4,000,000	Orange co., N. Y.	Ogden Gaul, 25 Pine, N. Y.
Hampton	1,800,000	1,800,000	Hampshire co. Mass.	C. W. Bryant, Boston.
Jefferson				65 Wall, N. Y.
King's Hill	6,000	60,000		W. L. Haskin, 180 B'way, N. Y.
Lake Superior	200,000	1,000,000	(Secs. 5 & 36 T. 49 & 50 R. (28 & 29 Marquette co., Mich.	C. L. Mather, N. Y.
Lancaster	50,000	250,000	Lancaster co., Pa.	J. R. Sibley, 35 Pine, N. Y.
Macomb	10,000	750,000	Macomb T. St. Law. co., N. Y.	C. E. Scofield, 42 Cedar, N. Y.
Maine	50,000	500,000	Eastport, Me.	A. L. Butler, 54 William, N. Y.
Mineral Point	100,000	500,000	St Lawrence co., N. Y.	H. W. Warren, 60 City Ex., Boston
Morgan	100,000	500,000		W. Williams, 42 Cedar, N. Y.
Manhan				39 B'way, N. Y.
Mount Hope	80,000	200,000	Mt. Hope, Orange co., N. Y.	W. Williams, 24 Pine, N. Y.
New Hampshire	100,000	500,000	New Hampshire	W. A. Farrar, 71 B'way, N. Y
N. Y. & Boston		1,000,000	Chester co., Pa.	S. M. Cockein, 22 William, N. Y.
Oswegatchie				24 Pine, N. Y.
Owens Lake	50,000	250,000		C. W. Boyd, 78 Cedar, N. Y.
Phœnix	50,000	250,000	Columbia Co., N. Y.	G. W. Butler, 54 William, N. Y.
Placentia Bay	200,000	1,000,000	Newfoundland	J. Simpkins, 29 Wall, N. Y
Ramsay	20,000	500,000	Township Ramsey, C. W.	C. W. Bryant, Boston.
Rochester	200,000	500,000		J. A. Ferguson, 8 Wall, N. Y
Rossie				24 Pine, N. Y.
Rosa Clara	100,000	1,000,000		H. Lathrop, 25 Nassau, N. Y.
St. Clair	100,000	1,000,000		H. B. Hawkins, 25 Nassau, N. Y
St. Joseph	100,000	1,000,000	St. Francis Co., Missouri.	Jas. R. Knapp, 6 Broad, N. Y.
Shawangunk	100,000	500,000	Mt. Hope, Orange co., N. Y.	E. P. Ackerman, 48 Fhe, N. Y
Sussex	25,000	625,000	Sparta Town. Sus'x co., N. J.	F. H. Stow, 53 Cedar, N. Y.
Walkill			Orange co., N. Y.	W. A. Scott, 11 Wall, N. Y.
Warren			Warren, Grafton co., N. H.	J. S. Christie, 100 B'way, N. Y
White Mountain			New Hampshire	111 B'way, N. Y.

SILVER.

COMPANY.	SHARES.	STOCKS.	LOCATION OF PROPERTY.	SEC'Y AND PLACE OF BUSINESS.
Amazon	25,000	$250,000	Nevada	W. L. Louther, 134 So. 3d, Phil.
Argentine	50,000	250,000	Argentine Dist., Colorado	D. L. Dennison, 134 State, Boston
Arizona	100,000	10,000,000	22 m W of Tubac, Arizona	J. B. Randol, 25 Nassau, N. Y
Astor	280,000	1,000,000	On Comstock Lode, Nev	J. Chapman, 71 Broadway, N. Y.
Atlantic & Pac.	50,000	1,000,000	Humboldt T. Hum Co, Nev.	J. N. Sewall, 8 Broad st., N. Y.
Big Smoky	20,000	600,000	Sulf'y Hill, Lander Co. Nev.	71 B'way.
Black Eagle	7,000	350,000	Carson, Owyhee co., Idaho.	O. B. Gardner, 40 Maiden lane.
Bullion	200,000	1,000,000	Bannock, Montana	55 Liberty street.
Bush	50,000	500,000	Austin City, Nevada	176 Chambers st., N. Y.
Combination	50,000	5,000,000	Nevada	J. W. Stoute, Jr., 155 B'way, N.Y
Colorado Con			Cedar Hill Nevada	New York.
Columbia	50,000	3,000,000	Austin City, Nevada	J. E. Smith, 10 Pine street, N. Y.
Conn. & Nevada	120,000	1,250,000	Averill, Churchill Co. Nev.	49 Liberty street, N. Y.
Commonwealth	200,000	2,000,000	Gold Hill, Nevada	78 B'way, N. Y.
Cosmos	10,000		Owyhee Co, Idaho	137 Broadway, N. Y.
Del Norte & S'br			Lower California	New York.
Durango	5,000	500,000		W. R. Garrison, 73 W'm st., N.Y.
East Bannack	100,000	200,000	Bannock City, Montana	J. Callender, 49 Ex. P., N. Y.
Empire G. & S.	100,000	10,000,000	Badie Bluff, Mono	H. R. Gates, 191 Broad'y, N. Y.
Empire and Silver State	20,000	2,000,000	Reese River Dist., Nevada	57 B'way, New York.
Eldorado	500,000	2,500,000	San S 90 m e of Austin, Nev	208 South Fourth street, Phila.
Essex & Dardem	125,000	2,500,000	Sierra dis. Humboldt C, Nev	A. R. Wetmore, 81 Vesey st., N.Y.
Franklin			Nevada	Philadelphia.
Gem	200,000	1,250,000		H. K. Gates, 191 B'way, N. Y.
Globe	100,000	500,000	Austin, Nevada	J. W. Brazier, 26 Pine, N. Y.
Good Hope	20,000	1,000,000	40 m S of Austin, Nevada	80 Broadway, N. Y.
Huron			Montana	New York.
Incas	300,000	300,000	Summit co., Colorado	J. P. Whitney, 19 Lindell, Bost.
Knickerb'r and Nevada	20,000	2,000,000	Union Dis. Nye Co, Nev	H. R. Slotwell, 70 Cedar, N. Y.
Lander Hill			Nevada	74 B'way, New York.
Lincoln		1,000,000	Owyhee Co, Idaho	80 Broadway, N. Y.
Lw'r California	40,000	2,000,000	North Part of Lower Cal.	55 William street, N. Y.
Madison	50,000	5,000,000	Nevada	W. W. Perkins, 71 B'way, N. Y.
Macedon			Nevada	Philadelphia.
Manhattan			Nevada	57 B'way, New York.
Merchants	50,000	600,000	Atlanta Co, Idaho	157 Broadway, N. Y.
Metropolitan	15,000	1,500,000	Austin City, Nevada	158 Broadway, N. Y.
Morning Star	5,000	5,000,000	Owyhee County, Idaho	157 Broadway, N. Y.
Mount Vernon	500,000	5,000,000	Mound Vernon & Mammoth District, Nevada	New York.
Mount Vista	50,000	500,000		J. Chapman, 71 Bway, New York.
National	15,000	1,500,000	Owyhee Co, Idaho	115 Broadway, N. Y.
Nevada	100,000	300,000	Mount inWells, D. Ch. co Nev	323 Walnut street, Phila.
Nevada	20,000	1,200,000	Nevada	E. L. Bo les, 74 B'way, N. Y.
New Y'k & Ione	20,000	2,000,000	Pine City, Nye Co., Nev	71 Broadway, N. Y.
New York	1,500	1,500,000	Austin, Nevada	S. R. Hutchinson, 80 B'way, N.Y.
New York City	50,000	5,000,000	Gold Can Dist. Lander Co. N.	10 Pine street, New York.
New Y'k Dis't	50,000	5,000,000	80 m Un Au tin, N. Y. Dis. Nevada	S. A. Hopkins, 71 Broadway, N Y
New Y'k & New	10,000	1,000,000	Nevada	J. J. Osborn, 30 Pine street, N. Y
N. Y. & Owyhee		1,000,000	Owyhee Co. Idaho	6 Pine street, New York.
N. Y. & Oro Fino	10,000	1,000,000	do. do.	137 Broadway, New York.
N. Y. and Silver Peak	20,000	2,000,000	Nye County, Nevada	R. C. Root, 74 Broadway, N. Y.
N Y. & Santa Fe			Nevada	New York.
N. Y. & Washoe			Nevada	New York.
North Am. M'g			Nevada	Philadelphia.
Ocean Transit		1,500,000	Lower California, Mexico	24 Pine, N. Y.
Ophir			On Comstock Lode, Nev	
Pah Ranagat Cl	50,000	5,000,000	Nevada	26 Pine, N. Y.
People's	100,000	500,000	Alpine & Sierra Counties	8 Pine street, New York.
Phœnix	200,000	2,000,000		48 East 20th street, New York.
Picacho	50,000	2,000,000	Arizona	T. H. Perkins, New York.
Pine Mount'n	50,000	5,000,000	Pine Mount'n Dist. Nev	E. K. McCulley, 100 Bway, N. Y
Pioneer & Inskip	10,000	1,000,000	Buena Vista Dis., Austin, Nev	D. H. Temple, 8 Pine street, N.Y
Prescott	50,000	2,500,000	Arizona	T. H. Perkins, New York.
Presidential	125,000	2,500,000	Austin, Nevada	Wm. Lemmon, 17 Broad, N. Y.
Republic	15,000	1,500,000	Amador, D Lander Co. Nev.	67 Ex. Place, New York.
Revenue Exten	50,000	500,000	Lander County, Nevada	W. L. Kite, 142 South 4th, Phila.
Rosario & Carmen	5,244	1,480,000	Sinaloa, Mexico	San Francisco.
San Antonio	60,000	3,000,000	Arizona	C. Lamson, 21 Nassau st., N. Y.
Seminole	7,000	1,500,000	Union, Humboldt Co., Nev.	L. G. Wilkin, 119 B'way, N. Y.
Silas Wright	60,000	600,000	Amador, D Lander Co. Nev.	18 Wall street, New York.
Silver Hill	40,000	1,000,000	Nevada	J. C. Hitchcock, 62 B'dway, N.Y
Silver Series		1,000,000	Lander Co., Nevada	W. B. Rogers, 117 B'way, N. Y.
South Boise, T Co	200,000	2,000,000	Alturas Co, Idaho	A. M. Palmer, 19 Broad st., N. Y
Star Hill	20,000	1,000,000	Nevada	155 B'way.
St'h Cl'r Crk			Colorado	Canastota, New York.
Stephenson	500,000	1,000,000	18 m E of Ft. Filmore	A. S. Kellogg, 22 Pine, New York.
Steptoe	20,000	2,000,000	Gold Can. Lander Co. Nev.	10 Pine, New York.
Sterling City		1,200,000		New York.
Tarshish	12,000	1,200,000	Toyabee Range, Un. D., Nev	H. S. M'Odium, 78 B'way, N. Y
Tempest	200,000	1,000,000		L. Bangs, 17 Nassau, N. Y.
Tetundo			San Antonio, Lo'wr Cal.	San Francisco.
Toyabee	50,000	5,000,000	Pine W'd, Mu'tn Dis. Nev.	J. M. Brown, 157 B'way, N. Y
Union & El D'o	100,000	1,000,000	Mogul Silver Mu'tn	40 Park Row.
Upper Missouri		100,000	Montana	107 Broadway.
Veilder	21,000	2,100,000	Amador Dist., Nevada	L. G. Bingham, 80 B'way, N.Y
Wamba Yuma	600,000	6,000,000	Arizona	35 William street, New York.
War Eagle	50,000	200,000	Owyhee Co., Idaho	G. M. Eldridge, 144 S. 4th, Pl.
Washington	22,500	2,250,000	Austin, Nevada	S. R. Hutchinson, 80 B'way, N.Y.
White Mountain			New Hampshire	111 Broadway, New York.

COPPER.

COMPANY.	SHARES.	CAPITAL.	SITUATION OF PROPERTY	SEC'Y., AND PLACE OF BUSINESS.
Astor,	20,000	500,000	Michigan,	Pittsburgh.
Adventure,	20,000	1,000,000	Parts of Sec'ns 5s, 36, T. 51, N Range 38 W.	W. H. Smith, 51 Ex. Pl., N. Y.
Etna,	20,000	500,000	1226 A in Secs. 6, 7, 18, T. 58, N R 28, W Keweenaw co, Mich.	R. A. Hoopes, 324 Walnut St., Phil.
Alb'ny & Bost'n	20,000	1,000,000	Secs. 7, 8, 9, 10, 11, T. 55, R. 33	Fred. Beck, 43 City Ex., Boston.
Anita,	20,000	500,000	Del Norte co., California,	8 Wall St., N. Y.
Algomah,	20,000	500,000	W½ S. 30, T. 51, R. 37,	L. W. Clark, Boston.
Allouez,	20,000	500,000	Town 57, R. 32, Sec. 31,	Horatio Bigelow, Boston.
Amy gal'yn't'l.,	20,000	500,000	E½ Secs. 16, 21, T. 58, R. 29, NW¼ Sec. 5, T. 57, R. 31, 160 A,	F. H. Wonrath, 324 Walnut St., Philadelphia.
Arcadian,	20,000	500,000	NW½ Sec. 20, T. 57, R. 33, 160 A,	C. P. Dixon, 48 Pine St. N. Y.
Atlas,	20,000	500,000	NE¼ of E½ & NW½ of NW¼ Sec. 31, T. 57, R. 31,	L. W. Clark, Boston.
Aztec,	20,000	500,000	W½ Sec. 31, T. 51, N. of R. 37,	L. W. Clark, Boston.
Bay State,	20,000	500,000	SW¼ Sec. 20, T. 58, R. 31,	L. W. Clark, Boston.
Bohemian,	20,000	500,000	E½ Sec. 31, NW¼ Sec. 32, T. 54, R. 37, W.	R. H. Rickard, 21 Nassau st., N. Y.
Boston,	20,000	500,000	Michigan,	H. W. Warren, 60 City Ex., B'st'n
Canada,	10,000	500,000	Brome co., Canada East,	H. P. Mound, 3 Hanover St., N. Y.
Calumet,	20,000	500,000	Michigan,	Boston.
Concord,	20,000	500,000	Michigan,	Boston.
Carp Lake, M.,	20,000	500,000	T. 51, N. R. 43, W. S½ of N½ of N. Sec. 14, and E½ Sec. 23, and NE¼ Sec. 23, 440 A	W. H. Abel, 70 Wall St., N. Y.
Cascade, M.	20,000	500,000	SW¼ Sec. 9, T. 49, N. R. 39, W. in Ontonagon co., Mich.	G. F. Riley, 35 Wall St., N. Y.
Copper Creek,	1,000	$100,000	Missouri,	H. M. Thompson, Missouri, Mo.
Copper Falls,	20,000	500,000	Sec. 14, T. 58, N. R. 31, W. Keweenah Point,	97 State, Boston.
Copper Harbor,	20,000	500,000	S½ Sec. 10, T. 58, R. 28, 320 A. Keweenah co.,	Fred. Beck, 43 City Ex., Boston.
Copper Creek,	20,000	500,000	Douglas co., Wisconsin,	T. B. Lawson, 71 Broadway, N. Y.
Central,	20,000	500,000	E½ Sec. 25, T. 58, N. R. 31, W.	J. Stanton, Jr., 25 Nassau, N. Y.
Cornwall,			Strafford, Orange co., Vt.,	D. H. Whitney, 17 State St., B'n.
Continental,	200,000	500,000	Martinsburg, New York,	I. Sickles, 50 Ex. Pl., N. Y.
Corinth,	20,000	500,000	Corinth, Orange co., Vermont	W. A. Cleveland, 191 B'way, N.Y.
Copper Hill,			Wisconsin,	Boston.
Dacotah,	20,000	500,000	Sec. 35, T. 55, R. 34, Portage Lake,	I. M. Cooper, Milk St., Boston.
Delaware,	20,000	500,000		S. M. May, 326 Walnut St., B'st'n.
Dorchester,	20,000	500,000	Michigan,	31 and 32 City Ex., Boston.
Douglas,	20,000	500,000	E½ Sec. 30, T. 55, R. 3,	S. J. Edwards, William St., N. Y
Eagle River,	20,000	500,000	T. 58, R. 31, S of Sec. 28, 29, 33, 34,	A. Lamson, 70 State St., Boston.
Fly,	100,000	500,000	325 A., Richmond, Canada East,	Ernest Sacchi, 82 B'way, N. Y.
Empire,	20,000	500,000	1708 A., S Sec. 1, 2, 11, 12, T. 58, N. K. 28, W. Keweenaw, Mich.,	J. S. McMullin, 423 Walnut, Phil
Eureka,	20,000	500,000	W½ Sec. 2, T. 49, N. R. 41, W. Ontonagon co.,	H. Shirley, 137 B'way, N. Y.
Evergreen Bluff,	20,000	500,000	NE¼ Sec. 6, T. 50, R. 28	E. W. Capen, 44 Ex. Pl., N. Y.
Edwards' Copper	20,000	500,000	Michigan,	H. K. Thomas, 12 Wall, N. Y.
Eagle Harbor,	20,000	500,000	Michigan,	51 Ex. Place, New York.
Frue,	20,000	500,000	Michigan,	A. S. Kellogg, 22 Pine st., N. Y
Flint Steel R.,	20,000	500,000	Sec. 11, 12, T. 50, N. R. 39, W.	F. K. McCully, 157 B'way, N.Y.
Forest City,	20,000	5,000,000	320 A. NE¼ Sec. 36, and SE¼ Sec. 25, T. 51, R. 43,	I. F. Paul, 19 Phœnix Building, Boston.
Franklin,	20,000	500,000	¼ Sec. 24, T. 55, N. R. 31 W.,	C. C. Evans, 26 Kilby St., Boston.
Franconia,	60,000	300,000	New Hampshire,	J. Hanna, 162 Fulton St., N. Y.
French Creek,	60,000	600,000	Chester co., Pennsylvania,	L. W. Davis,
Garden City,	20,000	500,000	SW¼ Sec. 60, N. W. Sec. 9, T. 58, N. R. 31 W.	R. H. Howe, Chicago.
Girard,	20,000	500,000	600 A. Sec. 15, T. 58, N. R. 28, W. Keweenaw co., Mich.,	B. A. Hoopes, 324 Walnut, Phil.
Gr'd Portage,	20,000	500,000	SW¼ Sec. 36, R. 34, W.	A. S. Kellogg, 22 Pine St., N. Y.
Great Western,	20,000	500,000	SE¼ Sec. 30, & SW¼ Sec. 20, T. 24, K., 329 A., Ontonagon	I. M. Cooper, 24 City Ex., B'st'n.
Hamilton,	20,000	500,000	SE¼ Sec. 35, N. Sec. 36, E. 50, R. H, SW⅛ Sec. 21, R. J. 20, 14½ A.,	J. B. Townsend, 44 Exchange, N. Y.
Hancock,	20,000	500,000	SW¼ Sec. 26, Tract of Sec. 25, T. 5, R. 24, W.,	Fred. Beck, 43 City Ex., Boston.
Hanover,	20,000	500,000	Michigan,	J. B. Wheelock, do.
Hartford,	20,000	500,000	52½ A. E½ & SE¼ Sec. 32, SW¼ & W½ Sec. 33, T. 50 R. 40, W.	T. M. Tyng, 61 Cedar St., Boston.
Henwood,			Michigan,	57 Broadway, N. Y.
Hope,	20,000	500,000	240 acres in T 57, R 32, Kew co	19 Nassau St., New York.
Humboldt,	20,000	500,000	Sec. 21, T. 58, R. 31, W.	Hor. Bigelow, 43 City Ex., B'st'n.
Huntington,	120,000	6,000,000	Boston, C. E.	Montreal.
Huron,	20,000	5,000,000	Sec. 2, T. 54, R. 34, W.	Hor. Bigelow, 43 City Ex., B'st'n.
Hilton,	20,000	500,000	Michigan,	W. H. Smith, 51 Ex. Place, N. Y.
Indiana Copper,	20,000	500,000	Michigan,	25 Nassau st.
Isle Royale,	20,000	1,000,000	NW¼ Sec. 1, T. 54, R. 34, W.	F. W. Chapen, 33 Ex. Pl., Boston.
Keweenaw,	20,000	500,000	Michigan,	F. W. Chapen, 44 Ex. Pl., Boston
Knowlton,	20,000	500,000	SE¼ Sec. 1, W½ of SW¼ Sec. 1, and other lands,	44 Ex. Pl., N. Y.
Lafayette,	20,000	500,000	Secs. 25, 30, 36, T. 51, N. R. 43, and 44, W. Ontonagon,	P. C. Blancan, 35 Wall st., N. Y
Lyster,	200,000	$400,000	Township Nelson, Canada East,	H. W. Nelson, 24 City Ex., B'st'n
Lower California	40,000	2,000,000	N. part of Lower California,	55 William St., N. Y.
Marlison,	20,000	500,000	Part sec. 18, 19 entire, 30, 31	Fred. Beck, 43 City Ex., B'st'n.
Merryweather,	20,000	500,000	Secs. 9, 19, T. 48, N. R. 4, W.	J. T. Waters, New York.
Meadan,	20,000	500,000	680 A. Secs. 8, 17, 19, 30, T. 58, N. R. 29, W., Keweenaw co., Mn.,	B. A. Hoopes, 324 Walnut, Phil
Manhattan,	20,000	500,000	W½ Sec. 11, NW¼ Sec. 14, T. 58, N. R. 32, W, 360 A.	J. W. Davies, 21 Nassau St., N Y
Mendotta,	100,000	500,000		M. Taylor, 30 Wall St., N. Y.
Mass. M. Co.,	20,000	500,000	SW¼ Sec. 7, T. 50, N.R. 38, W.	J. M. Cooper, Pittsburgh.
Mesnard,	20,000	500,000	NE¼ Sec. 24, T. 55, R. 34, Calaveras co.,	L. Burr, 12 Phœnix Bigs, Boston.
Melones & Stan.,	20,000	1,000,000	Sec. 15, T. 50, N. R. 39, W.	606 Mont St., San Francisco
Minnesota,			Maryland,	S. M. Bond, 12 Pine St., N. Y.
Maryland,			Maryland,	Baltimore.
Medora,	20,000	250,000	Michigan,	Pittsburgh.
Michigan,	20,000	300,000	Michigan,	W. H. Smith, 51 Ex. Place, N. Y.
Merrimac,	20,000	500,000	NW¼ Sec. 34, T. 51, R. 38, W. Ontonagon,	J. M. Mills, 284 Pearl St., N. Y
National,	20,000	300,000	Sec. 16, T. 50, R. 39, W. 1,988 A	J. M. Cooper, Pittsburgh.
Nequakett,	20,000	500,000	Sec. 26, T. 51, R. 43, Baltimore.	H. W. Nelson, 24 City Ex. Boston
New Burra,				A. L. Cunningham, 2 Ch. Av., Bos.
New England,	20,000	500,000		W. Bowes, 68 Wall St., N. Y.
New Jersey Con.	100,000	1,000,000	New Jersey,	T. H. Bell, Jr. 24 William St., N.Y
N. Y. & Passaic,	100,000		Harrison, Bergen c.,	T. H. Bell, Jr, do. do. do.
New Devon,				17 William St., N. Y.
North Western,	20,000	500,000	W½ Secs. 24, 25, 26, E½ Secs. 35, 35, T. 58, N R 31.	J. M. Cooper, Boston and Detroit.
North Cliff,	20,000	240,000	Michigan,	Pittsburgh,
Norwich,	20,000	500,000	Secs. 11, 12, T. 40, N R. 30, W and other lands, 1,300 A.,	P. C. Blancan, 35 Wall St., N. Y.
Ogima,	20,000	500,000	NW¼ Sec. 6, T. 59, N R. 33, W	G. F. Lellingwell, 7 Pine, N. Y
Ontonagon,	20,000	500,000	631 A. Secs. 20, 21, 28, T. 50 N. R. 39, W. Rockland,	G. Hart, 11 Pine Street, N. Y.
Otisville,	100,000	500,000	Otisville, Orange co., N. Y.,	C. Windsor, 60 Wall St., N. Y.
Penn. Manuf'g.,	20,000	1,000,000	320 A. Secs. 13, 14, 15, 24	
Petherick,	20,000	500,000	Michigan,	Boston,
Phœnix,	20,000	500,000	Michigan, ½ Secs. 10, 11, 12, 23, 25, T. 58, N. R. 30, W.	Boston,
Pewabic,	20,000	500,000	W½ Sec. 25, T. 55, N R. 34, W.	S. M. Day, 326 Walnut St., Phil
Pitts. & Boston,	20,000	150,000	T. 58, 57, N. R. 31, 32, W. 12,485 A.	C. Emery, 39 State, Boston.
Pontiac,	20,000	500,000	SE¼ Sec. 13, T. 55, N. R. 31, W	H. A. Johnston, Pittsburgh.
Prescott,	100,000	1,000,000	Central Arizona,	C. Emery, Kilbey St., Boston.
Providence,	20,000	500,000	240 A. in Keweenah co., NW¼ Sec. 10, W½ NW¼ Sec. 10, T. 57, R. 32, W.,	60 Broadway, N. Y.
Phila. & Boston,	20,000	500,000	640 A. Sec. 14, T. 58, N. R 28, W. Keweenaw co., Mich.	J. W. Davis, 21 Nassau St., N. Y
Quincy,	20,000	500,000	Sec. 26, T. 54, N. R. 34, W,	J. S. McMullin, 423 Walnut St., Boston.
Republic,	8,000	200,000		W. H. Smith, 51 Ex. Pl., N. Y.
Reliance,	20,000	500,000	Secs. 21, 22, 27, T. 58, N R 28, W, 10,785 A:	H. Baldwin, 70 Wall St., N. Y.
Rochester,	200,000	500,000		H. K. Thomas, 11 Wall St., N. Y
Rhode Island,	20,000	500,000	Michigan,	J. A. Ferguson, 8 Wall St., N. Y
Ridge,	20,000	500,000	Sec. 35, T. 51, R 28, W,	New York.
Rockland,	20,000	500,000	Sec. 11, T. 59, R. 39,	51 Exchange Place, N. Y
Resolute,	20,000	500,000	1120 A. Secs. 7, 18, 19, T 58, N. R. 29, W. Keweenaw co., Mich,	S. J. W. Barry, 71 B'way, N.Y.
St. Mary,	20,000	500,000		F. Beck, 43 City Ex., Boston.
St. Margaret	200,000	1,000,000	Canada,	E. B. Sutton, 43 Pine, N.Y.
Saint Clair,	20,000	500,000	Michigan,	Boston,
Sharon,	20,000	500,000	Ontonagon co., Mich.,	P. C. Blancan, 35 Wall St., N. Y.
Sheldon & Col.,	20,000	500,000	SE¼ Sec. 36, T. 55, R. 34, W. SE¼ Sec. 34, T. 55, R. 34, W,	S. J. Edwards, 22 Wm. St., N. Y
South Side,			T. 58, 59, N. R. 28, 30 W.	H. W. Nelson, Boston.
Societe Fran'se,	10,000			Copper Harbor.
Superior,	20,000	500,000	W¼ Sec. 14, T. 50, N R. 39, W.	S. J. W. Barry, 12 Pine St., N. Y
Toltec Consol.,	20,000	500,000	Secs. 25, 26, R. 50, R. 36, Wisconsin.	H. W. Nelson, Boston.
Ural,				17 William St., N. Y.
Vulcan,	20,000	500,000	120 A. Secs. 7, 17, 18, T. 58 N R. 27, W. Keweenaw co.,	F. K. Wonrath, 324 Walnut, Phil.
Victoria,	20,000	500,000	Secs. 20, 29, 30, 34, 51, T. 59 R. 39, and other lands.	L. W. Clarke, 23 City Ex. Boston.
Wolfmuc'na,	20,000	500,000	Secs. 17, 18, 19, T. 50, N. R. 38, W.	C. T. Howard, Boston.
Wickopee,	100,000	500,000	Massachusetts,	G. A. Sueden, 12 Pine St., N. Y
Vermont,	100,000	500,000	W. Fairlee, Orange co., Vt.,	191 B'way, N. Y.
Wauka Yuma,	600,000	6,000,000	Arizona,	35 William St., N. Y
Winthrop,	20,000	500,000	Michigan,	H. W. Nelson, Boston.

S, section; T, township; R, range.

AMERICAN

Journal of Mining.

[ILLUSTRATED.]

GEORGE FRANCIS DAWSON,
EDITOR

By publishing contributions, the JOURNAL OF MINING *does not necessarily endorse the positions assumed by contributors.*

OFFICE, 37 PARK ROW, NEW YORK.

Published Every Saturday Noon.

TERMS:

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NEW YORK, SATURDAY, JANUARY 5.

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INTERNAL REVENUE REPORT—INTERESTING TO MINERS.

From a lengthy and exhaustive report upon the United States Revenue just made to the Secretary of the Treasury, by Special Commissioner Wells, we find that in view of the probable surplus of revenue, he recommends specific reductions of taxation as follows:

First—A reduction of the present general tax of five per cent. on the products and sales of manufacturing industry to three per cent., and a corresponding reduction in specific taxes levied on analogous branches of industry.

Second—An entire removal of all direct internal taxes now levied upon the production of bar, plate and sheet iron, and of such additional taxes as are yet levied upon the elements of the manufacture of steel.

Third—A reduction of the tax of two and a half per cent. on the gross receipts of sugar refiners to one and a half or one per cent.

Fourth—An entire removal of the internal revenue duty on sulphuric acid, and on the mining and manufacturing of emery.

Fifth—The entire removal of the internal revenue tax upon the manufacture of salt.

The Commissioner also recommends that the existing tariff of 70 cts. per 100 lbs. on railroad iron remain unchanged; that low rates of duty with respect to scrap iron be adopted; that much higher rates on steel than on iron, be provided for; that foreign manufactured lumber be admitted free of duty; and with regard to coal, he says:

"The object of a duty is either revenue or protection. A smaller duty would increase the revenue by increasing importations. The present duty does not seem to have afforded protection. It is, perhaps, unnecessary to recapitulate here the well-known arguments for making coal free from all duty. The manufacturing industry of any country, to be permanently successful, must be based on cheap raw materials; and if there be any article then that should be exempted from taxation, both internal and customs, and afforded at the cheapest possible rate to all consumers, it is coal. Every person in this country has a direct interest that his house should be warmed and lighted at the lowest cost, and that his food shall be cheaply cooked, while cheap steam and cheap iron are essential, if the country is to maintain its position with other and competing commercial and manufacturing nations. The Commissioner, therefore, having in view the general welfare rather than any special interest, recommends that the duty on coal be either entirely removed or placed at the lowest point consistent with the requirements of the Treasury for revenue.

The "greatest good to the largest number" is the golden rule that has hitherto guided the nation, and if it can be shown that removal of duties on foreign coal will benefit more of our people than will be injured, it should be removed by all means. We have always believed that in articles of prime necessity—such as coal—free trade should prevail, and that with respect to articles of luxury, there should be protection. In other words, that there should be a *discriminating* tariff—because the rich few can take care of themselves, but the poor many need all the assistance that can be rendered them to keep them up from the depths. In our next issue we shall speculate on some of the probable results to follow the free importation of foreign coals into the United States. Meanwhile we turn to another portion of the report, and select from a long table of the aggregate receipts of internal revenue from manufactures and productions, for the past four years, such items as will most interest the mining community.

ARTICLES.	1863.	1864.	1865.	1866.
Brass, copper and yellow sheathing metal..	.....	76 874	469,280	405 172
Bullion.....	.....	.....	379,518	488 377
Coal.....	518,425	572,436	835,994	1 240,106
Copper and manufactures of	.....	43 681	388,920	575,528
Gold manufactures, jewelry, etc.....	85.599	218 914	543 430	640,602
Gunpowder.....	78.696	155,302	248 376	230.669
Iron, blooms, etc	.....	.....	52,158	52,258
Iron, bar, rod, band, sheet etc.....	258 526	435 911	1,022 615	1.355,226
Iron, plate.....	52 221	86 537	150,292	234 916
Iron, railroad.....	78,750	175 838	284,783	390,669
Iron, railroad, re-rolled	68,336	119 226	376,2?5	668,988
Iron, castings.....	50 349	242 737	798.201	1,367,825
Iron castings (stoves and hollow ware).....	79.952	123,489	211,849	297,632
Iron, cut nails and spikes	110,904	184,500	328,910	725,146
Iron, pig.....	.....	.....	1,484,383	2,255 893
Iron, rivets, nuts, etc...	6,812	43,729	66,198	.....
Iron, miscellaneous.....	.....	.....	.....	101,401
Iron, manufactures of...	963,802	1,891,062	3,729,005	5,342,305
Lead, sheet, lead pipe and shot.....	54.614	110,527	74,460	227 616
Lead, white.....	25,080	48 564	52,067	102 413
Lime and cement.....	.....	.....	96,440	208,666
Marble, etc.....	.....	.....	170,419	324,217
Oil, coal, refined petroleum, etc.....	649,962	2,255 329	3,047,213	5,317,396
Petroleum, crude.....	.....	.....	229,546	2,186,151
Pins.....	15 403	22,010	24,802	37 903
Salt.....	118,579	295,912	335 349	456.101
Steel	40,657	91,768	174 052	212.662
Steel, manufactures of..	149,226	299 373	549.767	714.211
Steam engines, etc.....	.....	.....	772,360	1.189,485
Silver, manufactures of.	18,372	36.950	59,768	128.522
Zinc, oxide of	15 806	28,276	41,641	48,243
Totals.....	3.239,561	7,831,963	10,940,537	27.545,343

It will be observed that the revenue derived from the above articles has about *doubled every year*. The total revenue from all manufactures and products during 1866 were $178,356,601, of which, it will be seen, that $27,545,343 was derived *directly* from our mines, the manufacture of articles from the products of mines, quarries, etc., or articles used in mining or milling—without counting any of the $13,615,723 which is put opposite the "miscellaneous articles." This is about one-sixth of the entire revenue from such sources.

PROPOSITION TO DRIVE AWAY FOREIGN CAPITAL FROM CALIFORNIA—AN AMUSING BILL.

In the San Francisco Chamber of Commerce, Alpheus Bull recently made a speech, in which he was immoderately severe on those who, after living some time in California enjoying "health, prosperity, a sphere for ambition, and an opportunity for thrift," have left that State for some other. He declared that "men who under such circumstances abandon California, are little better than traitors;" and the San Francisco *Call*, while endorsing his declaration, proposes, in addition to the existing *per capita* tax upon all who leave that State, to go further, and in the laws regulating taxation to "discriminate against the property of non-residents." A. Bull's arguments in support of his position are anything but able, and were he other than he is, some people might imagine that he had made himself out to be a far more gentle and more noisy quadruped. As it is, however, we doubt not that some one out in California will take him by the horns, and secure him, for he is evidently too wild an animal to be allowed to run around loose, snorting and cavorting in this manner. But it rather astonishes us that any respectable newspaper should endorse his absurd declaration, and add to it such a suggestion! California was and is a splendid country, but what made it so? What did all its boundless resources amount to, when it was inhabited and ruled by another people? California owes her present position quite as much to the muscle and pluck and energy of her "unfixed population"—to the people who have migrated from other States—as to her latent wealth; else would Mexico at the present moment be one of the foremost countries in the world. It would, therefore, be an ungrateful act to impose an extra tax upon the property of such persons as have been, but are not now, residents of that State. Again, if the property of all non-residents were subjected to such extra taxation, a death-blow would at once be struck at the introduction of foreign capital into California. All such capital now invested there—and it may be counted by millions of dollars—would be withdrawn, and that would make a pretty kettle of fish! It begins to look as if those who counsel such measures will turn out to be the real "traitors" to California. We believe that if the Legislature of that State were to enact a discriminating law of this sort, the Supreme Court would declare it unconstitutional, for taxation must be equal and uniform. The *Call*, generally correct, has this time "put its foot in it."

MEETINGS.

Shelburne Marble Co. annual, at 38 Beaver street, Jan. 8, 2 P. M.; Calumet Mining Co., at 114 State street, Boston, Jan. 9, 3 P. M.; Hecla Mining Co., at 114 State street, Jan. 11, 3 P. M.; New York and Nevada Mining Co., Jan. 7; Connecticut and Nevada S. M. Co. at 44 Pine street, Jan. 8; Revenue Extension S. M. Co. at Phil'a, Jan. 8; U. S. Mining and Ore Decomposing Co. at 157 Broadway, Jan. 8; Schuylkill Navigation Co. at 417 Walnut street, Phil'a, Jan. 7, 11 A. M.; Quimby Farm Oil Co. at 43 South Third street, Phil'a, Jan. 7, 3 P. M.; Eagle Spring Oil and Refining Co., 401 North Third street, Phil'a, Jan. 14, 3 P. M.; Davis Oil Co., 225 Walnut street, Room 9, Phil'a, Jan. 7, 9½ A. M.

DIVIDENDS.

Spring Mountain Coal Co. at 111 Broadway, 6 per cent., payable on or after Jan. 15; Mitchell Granite Co. at Boston, 6 per cent. (semi-annual); Roaring Brook Coal Co. at Boston, quarterly, 2 per cent., payable Jan. 15; Plimpton Iron and Steel Manufacturing Co. at 82 Federal street, Boston, semi-annual, 3 per cent., on or after Jan. 1, 1867; Henry Clay Coal Co., $3 per share, payable Jan. 10 to stockholders of 1st inst.

ASSESSMENT.

Hancock Mining Co., office 26 Kilby street, Boston, $8 per share payable Jan. 12.

Scientific Meetings.

GERMAN POLYTECHNIC ASSOCIATION.

STRENGTH AND DUCTILITY OF HARD-HEATED AND GALVANIZED IRON WIRE.

At the last regular meeting of this association—Mr. Rochow in the chair—Mr. Lucius gave the results of some experiments with hard heated and galvanized iron wire in relation to their strength and ductility. According to those experiments the strength of heated iron wire of our home manufacture stands as that of five to eight. The ductility of the heated wire was exceedingly great, being equally present in all parts subjected to experiment, so that at its close the wire had appeared at least two numbers smaller than before the tension, having sustained an elongation of 1¾ of an inch for every foot of its length. The largest

weight sustained by it produced a gradual diminution of its diameter, and which finally decreased to a point before tearing. A larger weight produced a more sudden rupture. Hard unburned wire showed no signs of rupture or distension, until carrying its greatest weight, when its diameter suddenly decreased to less than one-third of its original diameter at the point of rupture. The strength and ductility of galvanized iron wire was about 5½ as compared to that of hard wire; its strength being expressed by eight, behaving then like slightly burned wire. This seems to show that the diminution of strength of wire in galvanizing is due solely to the heat to which the wire is exposed in the zinc bath; the zinc itself, or its electric relation to that of iron, being of scarcely any importance.

The adaptation of wires to the construction of wire bridges, was then discussed at some length.

AMERICAN INSTITUTE—POLYTECHNIC BRANCH.

The meeting of the Polytechnic, usually held on Thursday evening, was postponed this week till Friday, owing to the occupation of the room in which the Association meets, by the stated meeting of the American Institute for January. As we go to press at an early hour on Friday evening we are unable to give our usual report of these proceedings this week.

Original Papers.

[WRITTEN FOR THE JOURNAL OF MINING.]

A STATISTICAL AND GEOLOGICAL REPORT UPON THE SLATE TRADE OF THE UNITED STATES.

By R. A. Parrish, Jr., A M.

Whilst every other mineral interest in the country has been the subject of occasional review, through some unaccountable omission no returns of the slate trade have ever been supplied. Its capital, industry, products, profits and rapid growth, and its relations either with domestic or foreign markets, up to the present time, have been totally ignored. Not one of our journals have reported them. It is proposed, therefore, in the present article, to supply this omission, and whilst presenting the economic and financial details of the subject, to superadd such geological and engineering suggestions as appear to be germain.

The roofing and school-slate of commerce is known, geologically, as argillite, or argillaceous slate (German, schiefern; French, schiste ardoise). Under the more comprehensive and general term of Slate, however, the following several species are included:

I. Mica slate.—Rarely found suitable for roofing, but mostly used for flags, furnace-hearths, etc.

II. Clay slate.—The slate of commerce.

III. Talco-micaceous slate.—Used for whetstones, etc.

IV. Polishing slate.

V. Drawing slate, or black chalk.

VI. Adhesive slate.

VII. Bituminous shale.

VIII. Slate clay.

Some of these varieties are found to pass into each other by insensible gradations, as does the clay slate, also, into the inferior schistose rocks and limestones. The shales, indeed, appear to be nothing else than slate clay imperfectly indurated, and have been compared to bricks half burnt.

The mechanical intermixture of foreign matter at the time of the deposition of the rock, or the metamorphic effects of heat, and of chemical agents afterwards, explain the distinctions found in the above varieties.

We can interpret the first of these causes (namely, the mechanical intermixture of foreign matter) by what is now going on at the mouth of the Mississippi. Its three annual floods—first, that of its Ohio branch; second, that of the Northern Mississippi; and third, that of the Missouri—never occur simultaneously, but following each other at guarded intervals in the order mentioned, not only save its southern valley from a deluge, but distribute upon the bed of the sea, intermixed with its prevailing alluvium, three varieties of a different matter. The Red river and Arkansas floods, in lesser degree, interstratify the mass with other characteristics. The super-addition of the constituent elements of limestone, whether occurring constantly or casually, and whether over the whole or but a part of the bed, accomplishes a more or less exact parallel with what is seen in many of the extant rocks.

This last process, as employed by nature—that of interblending the limestone—is, (in connection with another subject,) thus described by Capt. E. B. Hunt, U. S. Topographical Engineers, in an original article on the "Origin and Chronology of the Florida Reef." "It results that in all storms of much violence, the water over the Florida bank becomes white with the bottom deposits. In long and severe northers or gales, the water becomes almost milk-white across the whole bank. This white water is a familiar appearance, and is one of the sure signs of proximity to the reef. As the storms subside, the white mud is gradually thrown down, and the water clears after a day or two, to its peculiarly delicate transparency. During the white water periods, the flood-tidal current sets the white water over the north side of the bank into the Bay of Florida, where, by reason of the greater depth, the process of deposition goes on, and the floor of this bay has become covered with a white mud, and has been brought up with a singular evenness to the prevailing depths."—*U. S. Coast Survey*, 1862. *p.* 244.

A satisfactory solution of what, at one time, proved an inscrutable paradox, is thus afforded, and we here seem to accompany nature to her very officina scopulum, and detect the causative method of that gradual and insensible transition of the one into the substance of the other, which so often characterizes the stratified rocks.

Subject to such, or like conditions, the sedimentary rocks and slates were originally formed. To the casual presence of metallic oxides in the slates, their several colors are mainly to be ascribed. These colors are principally a dark grey, but often with a shading of other tints. They also occur green, yellow, purple, brown, red, and even cherry-red—for the most part in separate strata, but sometimes mottled or in stripes. In the product of some quarries, these colors are permanent and unfading; in that of others, they gradually fade into a dirty chocolate or coffee color. Hence, in covering costly structures with parti-colored slate, whose roof and spire are often intended as salient points of beauty, too much caution can scarcely be observed in tracking the slate home to quarries of repute.

The blue color is due to the presence of carbon, the purple to copper, the green to magnesia, the browns to iron, &c., &c. An excess either of iron or of lime renders the slate worthless, inasmuch as they occasion its disintegration when exposed to the weather. The iron is usually present in the form of pyrites, or the sulphate.*

Upon the fundamental granite, gneiss and schist, (which constitute the rocky floor upon which all the younger rocks are superposed) occur in regular succession along the Appalachian chain—first, the primal white sandstone; second, the Kittatinny, or magnesian blue limestone; and third, the Matinal or Hudson river Slates. Nine other formations follow each other up to the coal measures, and still others to the horizon of the present day—the grassy carpet upon which man now resides. These, however, are generic expressions, and take no cognizance of the casual absence of some of these rocks here and there—or of the causes which explain this absence.

The throes and contortions which from time to time have beset these rocky coverings, together with the potent denuding agencies which in the lapse of vast geological periods have been at work upon them, have had the effect of displaying to day-light in many places, their basset edges and bringing them within the convenient reach of man. Although their stratification was originally horizontal, and consisted of a series of laminæ lying parallel with the water-level, yet the disturbing causes in question have acted with an energy such as to throw them into every imaginable attitude. In some places they still maintain the original horizontal; in others, stand perpendicularly upon their edges—at others again are inclined at any intervening angle, or curved into every conceivable corrugation. The Slates have participated in all these movements, and sometimes are found worthless from comminuted fracture, or from consolidation into hard and intractable masses interveined with quartz.

That the sedimentary rocks (of which the Slates are amongst the oldest) are the accretion of an almost infinite antiquity, is attested by their aggregate thickness of nearly twenty miles, every atom of which, was deposited upon the ocean's bed by aqueous currents. Their origin refers to eras, whose prodigious remoteness can only be interpreted by their intrinsic chronology. Like the ephemeral ruins of Nineveh or Egypt, whose hieroglyphics chronicle for a few thousand years, the rise and fall of human dynasties, the most of these relics of the past, have also their hieroglyphics and mausolea, comprehending, not for thousands only, but for incomputable millions of years, the dynasties of Flora and Fauna, that reigned and perished in the primæval world.

The exposed zone of the Slates, extends from Canada nearly to the Gulf of Mexico, and from a line on the Atlantic slope (hereafter to be traced) thinning as they go, toward the base of the Rocky Mountains. On their eastern edge they display a belt from three to twenty miles in width, and attain in places to the stupendous thickness of a mile.

That the upheavals of these rocks are due to volcanic causes, is demonstrated by the palpable effects of heat which have accompanied them: for under all the anticlinal axes of the Slate we detect indications of an exalted temperature, to which alone the origin of their *planes of cleavage* can be intelligibly referred. According to Rogers (whose facts and reasoning on this point are alike irresistible), the "cleavage planes invariably approximate to parallelism with those great planes in the crust, which appear to have been the planes of maximum temperature."

It is this property of cleavage which endows the Slate with all its economic value. Without it, and indeed without possessing it in a superlative degree, it would have remained a mere building stone. The planes of cleavage, which have no reference to its original planes of stratification, nor to its *folia* (or the natural seams, more or less at right angles therewith), incline at various angles in various localities (always subject to the law above stated), but invariably pass at the same angle through the adjacent under and overlying rocks; in many instances accompanied by the obliteration of the stratification. But although the adjacent rocks take on a similar cleavage, yet from their diverse lithological structure, they never attain the faculty of cleaving into plates so thin. In some cases, the talcose and mica-schists approach it pretty nearly; the sandstones and limestones never. Even if they did, they would lack the surprising toughness of the slate, which seems to be attributable to its finely levigated particles and peculiar atomic composition.

The harder varieties of the commercial slate are used for roofing; the softer for school slates and slabs for various manufactures; whilst it is only out of the softest beds that slate pencils of good quality are made. With a wide-spread and almost prodigal beneficence, Nature seems to have diffused the slates, as she has the coals and other useful rocks, in almost every land. They prevail nearly all over continental Europe, as well as in England, Scotland, Wales, and Ireland.

The earliest historical account of slate as an article of commerce, refers to Ireland as the original source of supply. The quarries (most probably those of the county of Waterford adjacent to navigation) were in a region then known as Ardosia, whence they were shipped early in the middle ages to all parts of Europe. Hence their French and continental name of Ardoises. No reliable record of the exact origin of this commerce can be found, but it must have preceded by many centuries the opening of the quarries of other countries; historical hints of which, together with other points of interest, will constitute the theme of future consideration.

TO BE CONTINUED.

* Sulphuret? [Ed. Jour. of Mining.]

[WRITTEN FOR THE JOURNAL OF MINING.]

THE ELECTRO-POSITIVE METALS.—No. 10.

SODIUM—ITS PROPERTIES.

By JOSEPH HIRSH, Ph. Dr.

Sodium possesses a silver color and brilliancy, is a good deal whiter than potassium, the general properties of which it possesses. Its affinity for oxygen is inferior to that of potassium, for which reason its surface tarnishes less easily, while it does not ignite when thrown upon cold water in small quantities, but only moves about with great rapidity, fusing into a bright ball, which gradually dissolves, diminishing in size until it completely disappears.

But if thrown upon cold water in larger quantities, it throws sparks of sodium about, and in very large large quantities may entirely ignite. Thrown upon water heated to 150 deg. F., it ignites, even in small quantities. This phenomenon occasionally is observed with water of but 100 deg. F.

Placed upon moist wood, charcoal, or upon a thick mucilage, it ignites. When sodium, floating upon water is rapidly immersed under the surface of the water, a violent explosion ensues, which easily breaks a glass or porcelain dish, if in such the experiment is performed. This explosion is similar to the one taking place when red hot coal, laid upon a moist spot, is crushed by a sudden blow, which will produce an instantaneous decomposition of the water, accompanied by a loud report and a throwing about of burning coal.

The combustion of sodium is characterized by the yellow color of its flame, which at once distinguishes it from the violet color of potassium.

It may be alloyed with potassium by simple pressure, and will then ignite on cold water in small quantity.

Exposed to the air, the metal rises slowly, its surface becoming coated with caustic soda. Heat favors this oxidation, but ignition takes place only when the metal is almost red hot. During combustion sparks of burning metal are thrown about. Spirits of turpentine slowly attack sodium, so that its surface soon acquires a crystalline appearance, similar to that produced by the action of acid upon tin. They plainly show the crystalline structure of sodium. At the common temperature it is harder than potassium, but may easily be moulded between the fingers. It is softer and more plastic than the rest of the ordinary metals, is easily pressed into very thin sheets, remaining plastic even at its freezing point.

It softens at 100 deg. F., melts at 204 deg. F., does not volatilize at the heat requisite for melting glass Its specific gravity is 0.972.

Its preservation is entirely analogous to that of potassium, while its uses, although of the same nature as those of potassium, are more economical and therefore more general.

Among those uses is to be mentioned first its reducing power, which is employed in the production of all the electro-positive metals, as aluminium, magnesium, calcium, etc., and next its employment in the reduction of the noble metals in the state of amalgam, which important invention we owe to Mr. H. Wurz, of this city, who received a patent for his valuable invention in December, 1864.

The use of sodium in the reduction of the electro-positive metals I shall refer to in treating of the preparation of those respective metals, while, for the sake of completeness, I shall briefly mention the invention of Mr. Wurz, the same having been treated already at length in the columns of this paper. It consists, according to the specifications of the patent, in increasing the adhesion, attraction or affinity of quicksilver for other metals as well as for itself, by the addition of a minute portion of a highly electro-positive metal, as sodium or potassium, the inventor calling the amalgams so produced "magnetic."

In reducing valuable ores, one per cent. or less of this amalgam is added to the quicksilver used in the reduction of the metal from time to time, the frequency of these additions depending upon various circumstances, as temperature, quantity of water used, its purity upon the surface of the mercury offered to the ore, upon the amount of motion, the nature of the ore, of the general process used, upon the strength of the amalgam, &c.

The reduction of the noble metals from their salts, especially sulphates and chlorides, by metallic iron or zinc, in connection with quicksilver, may be greatly hastened by the addition of amalgam to the latter—the effect being alike with the natural and artificial compounds of the noble metals.

The amalgamation of metallic surfaces, which does not take place with mercury alone, is easily accomplished by the sodium-amalgam. This property is especially important in the employment of copper and iron utensils in the extraction of gold from its ores.

Another use of the amalgam is its power to render mercury solid, which will greatly facilitate its transportation, rendering practical for that purpose vessels cheaper than those used now for its preservation, while it may easily be sold in pieces of all shapes and all sizes. If this solid mercury is to be used as an amalgam, it requires only the addition of some liquid quicksilver, while, when pure mercury is to be used, it may easily be deprived of its sodium by washing the amalgam, cut in small pieces, with hot water, slightly acidulated with sulphuric or acetic acid.

Some interesting researches on the influence of sodium amalgam upon different metallic salts were made by N. Bunge. According to the same, it reduces easily the chlorides of mercury and gold; the haloid compounds of silver are rapidly reduced by it, when a thin and broad piece of the amalgam is placed upon the powdered substance, which is slightly moistened in an eprouvette.

The chloride of iron dissolved in muriatic acid is quickly reduced to the muriate partly, and partly to the metallic state, to which it is reduced completely when the quantity of the amalgam is sufficiently large. In the latter case iron amalgam remains behind.

Chloride of chromium, suspended in the same manner in diluted muriatic acid, gives, under the same treatment, a chrom-amalgam of an unstable nature. Before complete reduction, the liquid assumes a deep green color. Bunge especially recommends the amalgam for the decomposition of the chloride, bromide and iodide of silver, acknowledging that an æthereal solution of chloride of iron is acted upon but slowly by the amalgam, which does not affect at all the chloride of silver in contact with petroleum. Sodium in its combinations may be counted among the most useful substances of our globe, all over which it may be found.

Combined with oxygen it is used in the arts and in medicine. It is found in all the soils, is a necessary constituent of our food, and of that of plants.

Combined with chlorine, it fills our vast oceans, nourishing the plants of the sea, preventing their decay when their life is extinct.

In the same state it is found in many of our hills, whence it is made serviceable for the preservation of our food and the manifold arts of life.

Lately the chloride of sodium was tried in the reduction of the precious metals, according to reports, with as good success as sodium-amalgam, and may before long play a part of especial importance in the utilization of our mines. The importance of the compounds of sodium in agriculture is best illustrated in those districts whence this substance has been removed with the crops, without being returned again, as in Virginia tobacco-fields, which exhibited so remarkable a degeneration in a comparatively short time, because that rich soil was considered inexhaustible.

The same was found on the European sugar-beet fields, which, during the first years of the continental sugar-culture, were exhausted. But soon experience taught the farmer to give back to the fields the soda removed with the beets and contained in the refuse molasses, when at once fertility was restored and the fields yielded regularly good crops. The general use of the compounds of sodium is too well known, to require further notice.

[TO BE CONTINUED.]

California Geological Survey.

The San Francisco *Times* mentions the return to that city of three field parties connected with the State Geological Survey, having completed their work. Prof. Whitney will probably now be able to finish his report on the coal oil interest of the State. He has been engaged some time in its preparation.

MARKET REVIEW.

FRIDAY EVENING.

Gold and Silver Stocks have been active. Albion has advanced 10 cents—$1 60 bid; Alpine brought $1 75 yesterday, $2 25 was asked to-day; American Flag has been brisk at $1 70 @1 85; Atlantic and Pacific continues to be active at advanced rates, selling at to-day's board for $4@4 30; Bates & Baxter, $1 90 bid; $1 35 was given for Benton; Bobtail, $3; Boscobel, $1 35@1 50; Bullion Consolidated continues dull at $3; Burroughs, 30@50c.; Church Union held at $2 50; Crozier held at 50c.; Columbian, $1 80@1 90; 80c was bid for Consolidated Colorado; Consolidated Gregory has been in demand, selling at $15 early in the week, to-day $17 50; Corydon has also been in demand, with transactions at $5@5 15, an advance of $1 30 during the week; Downieville still keeps on the market at 10c.; Echo was held at $3 25; First National, $4 25; 25c was bid for Fall River to-day; $2 50 for Gilpin, with sales at $3 after call; Gold Hill has advanced to $3 50, $1 25 above last quotation. Some business was done in Gunnell at a slight advance, $1 25 was offered; no transactions have been reported during the week in Holman; Hope sold for $1 10; Keystone held at 10c.; Kipp & Buell 80@95; $1 25 was asked for La Crosse, but sales were made at $1 20; $1 for Liebig; Liberty active, with large sales during the week, 10@11c.; Mariposa pref. 32¼; Mill Creek unchanged. Parties who valued it at 25 cents day before yesterday would have sold at 14c. to-day; Montana 30c.; New York active at $2 60@2 65@2 70; Nye 10@12c.; Oak Hill held at $2 54; Pahranagat was lively at $2 75@2 80; Peoples also at $1 60@1 70; Quartz Hill advanced to $4 75, with sales at that figure; Rocky Mountain sold after call at $3 25; $8 65 was given for Smith & Parmlee, an advance of 55 from last quotation; Texas $2 04; Yellow Jacket 25.

At the Second Board to-day: American Flag sold at $2 10; Benton $1 35; Corydon $5 30; Gunnell $1 26; Hibbard 85c.; Liberty 12c.; Keystone 10c.; Pahranagat $2 75; Quartz Hill $4 95; Rocky Mountain $3; Smith & Parmelee $8 60; Consol Gregory $17 75; Peoples $2.

Copper Stocks have been slow the past week, with but few transactions. Quotations to-day were as follows:

	OFFERED.	ASKED.
Canada	50	....
Charter Oak	....	1 10
Davidson	50	....
Evergreen Blue	....	11 00
Hilton	1 00	.....
Indiana	....	4 00
Knowlton	....	4 25
Rockland	9 00	....
Superior	3 75	....

Lead Stocks.—Walkill has been quite active, selling on Wednesday at $1 50; yesterday, $1.45; to-day, $1.39, a decline of 6c. from last week's quotation; Tudor quiet, $3.15 bid.

Miscellaneous Stocks.—Long Island Peat, $4.26; Iron Tank Storage Co. appears to be under a cloud, selling on the 24 inst. at $35, or a decline of $28.50 since last Friday; to-day, however, a better feeling was apparent, being held at $55.

Petroleum Stocks.—The following were the quotations to-day:

	Offered.	Asked.
Beauchoff Run	$3 00	$3 50
Bergen Oil & Coal	....	30
Buchanan Farm	....	25
Central	1 05	1 15
Clinton Oil	1 40	1 75
Excelsior	15	....
First National	....	3
Manhattan	19	25
Mountain Oil	....	70
New York and Allegheny	....	5 50
New York and Newark	....	12
Pit Hole Creek	....	1 00
Rynd Farm	....	25
Shade River	....	10
United Pet. Farms	....	25
United States	4 75	4 00

Coal Stocks were more in demand.

Cumberland	80½
American	67⅛@ 68
Spring Mountain	70 @ 76
Central	50 @ 55
Wilkesbarre	51 @ 62
Del. & Hudson Canal	154 @156
Pennsylvania	145 @160
Cameron	12½

Government Stocks—Firm and active.

U. S. 6s, coupons, 1881	108
U. S. 5-20 coupons, 1862	107
U. S. 5-20 coupons, 1864	105½
U. S. 5-20 coupons, 1865	105⅛
U. S. 10-40 coupon	99⅛
U. S. 7-30, August	105
U. S. 7-30, June	104⅛
U. S. 7-30, July	104⅛

Foreign Exchange is dull but firm. Bills at 60 days on London are quoted at 108½@109 for commercial, 109¼@109⅜ for bankers; do. at short sight, 110⅛@110¼; Paris, at 60 days, 5.17½ @5.15; do. at short sight, 5.12@5.12¼; Antwerp, 5.17½@ 5.16¼; Swiss, 5.17½@5.16¼; Hamburg, 36⅜@36⅞, Amsterdam, 41¼@41½; Frankfort, 41⅛@41⅜; Bremen, 78¼@79; Prussian thalers, 72¼@72½.

Gold.—Was 139⅛ at 2 P. M.

Copper.—Last week we reported considerable dullness in this market. We anticipated an increased sale this week. There have been large purchases made at prices quoted; there is considerable promise of a brisk trade.

Iron.—The market still continues dull. Wholesale dealers as well as those in the retail trade complain of the lowness of prices. The following are the retail quotations per ton: Swedish iron $162½ to $172½; common $102½ to $167½; refined $112½ to $117½; band $142½; rods 3-16 to ⅜ $117½ to $172½; scroll ⅝ to ⅞ $142½ to $190; horseshoe $137½ to $145; hoop ⅝ to 2 $147½ to $210; nail rod 8¾ to 10¾ cts.; ovals ½ to 1½ 37½ to 147½.

Steel.—As with any fluctuation in the market we expect an in-

crease in the prices of steel, an increase in the desire to do business has been perceptible last week.

Tin—The market in tin has been steadily improving. Some large sales have been made; the house of Phelps, Dodge & Co., report sales of from 6,000 to 12,000 slabs at from 21¾ to 22; Coke tirne of the common kind sold at from 6¾ to 7; of the better descriptions the prices were 7¾ to 8¼.

Lead—Inactive. English 6¾ to 7 (gold); German and Spanish selling for 6.75 (gold.)

Spelter—American has declined. We find it quoted this week at 8½ to 9¼.

Zinc—Sheet zinc remains at prices quoted 12 to 12½.

Petroleum—Is dull. We quote crude 40@47 gr., in bulk, at 13@13½c; do. in bbls. 19½c; do refined in bond, light straw, 24½; do light straw to white 25@26½c; do prime light straw to white, 28@28½c; do standard white, 29½@31c; do prime white, 30@31½c.

Gunpowder—Unchanged.

Quicksilver—Quotations steady.

THE COAL TRADE.

FRIDAY EVENING, Jan. 4, 1867.

Wholesale.—The market is extremely quiet, and few sales have been made during the past week of either Domestic or Foreign. The principal feature of the week was the Scranton sales which took place on Thursday last, when 30,000 tons of coal were disposed of at a slight advance, as compared with the November sale. The attendance was fair and the bidding quite spirited. Below will be found a full report:

Auction Sale of Scranton Coal by the Delaware, Lackawanna & Western R. R. Co., Jan. 3rd, 1867—

LUMP—6,000 Tons.

4,000 tons at $2 75	500 tons at $3 87
1,000 " " 3 85	500 " " 3 95

STEAMBOAT—3,500 Tons.

1,000 tons at $4 62	800 tons at $4 87
1,700 " " 4 75	

GRATE—5,000 Tons.

1,000 tons at $5 12	1,000 tons at $5 50
300 " " 5 25	850 " " 5 55
1,000 " " 5 20	150 " " 5 60
700 " " 5 35	

EGG—4,500 Tons.

3,700 tons at $5 15	800 tons at $5 20

STOVE—7,500 Tons.

5,100 tons at $5 55	2,400 tons at $5 60

CHESTNUT—2,500 Tons.

1,000 tons at $4 39	2,500 tons at $4 35

Comparing this sale with that of November, 1866, we have the following:

	Nov. 27, 1866.	Jan. 3, 1867.
Lump Coal	$3 65@$4 00	$3 75@$4 95
Steamboat	4 50 " 5 00	4 62 " 4 87
Grate	4 75 " 5 20	5 12 " 5 60
Egg	4 90 " 5 00	5 15 " 5 20
Stove	5 00 " 5 85	5 55 " 5 60
Chestnut	3 75 " 3 85	4 30 " 4 35

The next regular sale of "Pittston" coal will take place on the 13th of February, when from 150,000 to 250,000 tons are advertised to be sold. The sale will take place under the supervision of the Pennsylvania Coal Co., at 111 Broadway (see advertisement). Endeavors are being made to inaugurate a new Coal Exchange in this city. We have seen the call for a meeting to take place on Thursday next, Jan. 10, at two o'clock P.M., at the Exchange Sales Rooms, 111 Broadway. Many of our leading dealers have signed their names to the call. We wish the movement all the success it deserves.

Retail.—There has been considerable doing for home and manufacturing purposes during the past few days. Trade in the average, however, is considered quiet. Prices range from $6 25 to $8 50 for the various sizes and qualities.

Reports of the Coal Traffic for the Last Week

as compared with those of the corresponding week last year, are as follows:

	1865. WEEK.	1865. TOTAL.	1866. WEEK.	1866. TOTAL.	INC. & DEC.
Phil. & Reading R.R.	....	2,802,935	.....	3,425,550	622,615
Schuylkill Canal	....	1,022,740	.....	1,296,357	273,617
Lehigh Val. R. R.	....	1,402,277	.....	1,703,475	328,198
Lehigh Canal	....	888,784	.....	1,066,307	177,523
Del & Hudson	....	762,612	.....	1,302,894	540,282
Scranton North	8,075	264,293	5,417	425,961	161,668
Scranton South	18,350	742,780	19,450	1,084,836	342,056
Penn'a. Coal Co. Rail	.....	530,457	14,397	510,475	19,982
by Canal	.....	47,025	.....	24,909	d 22,116
Wyoming North	.....	28,957	.....	105,002	74,836
Wyoming South	.....	329,506	.....	463,642	134,136
Shamokin	.....	455,008	.....	552,339	97,331
Trevorton	.....	29,742	755	51,628	21,816
Short Mountain	.....	74,005	740	111,851	37,846
Franklin	.....	57,260	.....	32,747	24,522
Broad Top	.....	315,996	2,403	265,043	d 50,953
	.....	9,753,804	.....	12423786	.....

For Monday, December 31st, 1866.

Scranton North	.....	.....	1,484	427,446	.....
Scranton South	.....	.....	4,108	1,088,914	.....
Broad Top	.....	.....	623	265,069	.....
			6,215		
				6,215	
				12,423,786	
Grand Total for 1866				12,430,001	
" " for 1865				9,753,804	
Increase				2,676,197	

Coal Trade for 1866 and 1867.

Amount of Coal shipped over Philadelphia and Reading and Lehigh Valley Railroads since the commencement of their new year, with that of corresponding week last year:

	1866 WEEK.	1866 TOTAL.	1867 WEEK.	1867 TOTAL.	INC.
Ph. & R.RR	.....	194,232	14,908	99,132	95,100
L.V. R.R..	26,043	80,887	10,379	32,469	48,417
Total....		275,119		131,601	
Dec.....				275,119	
				143,518	

Lehigh and Mahanoy Coal Trade,

For week ending December 29, 1866.

NAMES OF SHIPPERS.	WEEK.	TOTAL.
Trenton Coal Co.	.....	77 08
Mount Etna	.....	46 04
Mahanoy Coal Co.	.....	.....
Delano Colliery	561 04	1,100 14
Glendon Coal Co.	102 04	131 14
Rathburn, Stearns & Co.	38 13	208 04
E. S. Silliman	1,646 12	8,088 16
McNeal Coal & Iron Co.	69 08	374 09
Knickerbocker Coal Co.	.....	89 08
Thomas Coal Co.	.....	193 17
Williams & Herring	136 18	274 00
Other shippers	.....	10 02
Total	2,754 19	10,661 16
Corresponding week last year	3,906 18	10,047 02
Increase	.....	614 14
Decrease	1,151 19	.....

Lehigh Coal Trade, for Week Ending Saturday December 29.

OPERATORS.	RAILROADS. Week.	RAILROADS. Total.	CANAL. Week.	CANAL. Total.
Ashburton Coal Company	....	.....	....	163
Audenried	....	508	....	13,527
Baltimore Coal Company	739	2,881	....	14,195
Buck Mountain	....	693	....	24,485
Central Coal Company	....	.....	....	.....
Coleraine	445	1,746	....	25,572
Council Ridge	....	2,750	....	.....
Coxe Bro. & Co.	....	.....	....	7,266
Connery, John	42	243	....	.....
Coal Run Coal Company	....	.....	....	.....
Cross Creek	27	586	....	.....
Delano	693	970	....	5,305
East Boston C. Co.	10	501	....	.....
East Sugar Loaf	96	581	....	.....
Ebervale Coal Company	....	1,650	....	27,758
Franklin Coal Company	....	264	....	12,502
Ger Pa Coal Company	626	1,140	....	25,282
Glendon Coal Company	25	55	....	6,784
Germania Company	305	911	....	10,715
Hazleton	160	1,207	....	76,486
Harleigh	....	415	....	16,729
Highland Coal Company	....	.....	....	.....
Hillman & Son	179	283	51	51
Honey Brook Coal Company	1,254	3,892	....	.....
Hull & Co., Thomas	....	.....	....	32,327
Jeddo (G. B. M. & Co.)	81	2,175	....	14,250
Knickerbocker	....	80	....	55,597
Lauback, J. & Co	....	.....	....	9,766
Lehigh Zinc Company	....	.....	....	1,475
Lehigh & Susquehannah	....	55	....	.....
Lehigh Coal & Navigation Co.	1,272	1,527	....	11,842
Mahanoy	....	.....	....	390,619
Mount Pleasant	....	284	....	.....
Meadow, R. (D. W.)	....	58	....	6,475
McNeal Company	109	651	....	21,270
Meyers, H.	....	.....	....	.....
Mount Etna Coal Company	....	58	....	4,527
Morris and Essex Mutual	....	978	....	805
New Boston C. Co.	....	.....	....	.....
New Port C. Co.	....	.....	....	1,524
New York & Lehigh	....	.....	....	.....
New Jersey	318	894	....	5,301
North Mahanoy	....	.....	....	8,585
Packer, Skeer & Co.	....	.....	....	84,305
Patterson, W. T.	....	.....	....	.....
Parish & Thomas	424	2,411	....	405
Primrose Coal	....	.....	....	1,342
Rathburn, Stearns & Co.	....	336	....	.....
Reber, J. B. & Co.	....	.....	....	.....
Sharpe, Weiss & Co.	....	.....	....	29,804
Stout Coal Company	....	548	....	18,821
Spring Mountain	....	523	....	6,356
Silliman	1,702	7,704	....	.....
Shamokin Coal Company	....	.....	....	.....
Thomas Coal Co.	51	433	....	3,085
Trenton Coal Company	....	77	....	379
Union	....	336	....	3,962
Wilkesbarre	557	1,028	....	15,696
Woodside Company	....	.....	....	.....
Warrior Run	211	296	....	6,310
Wyoming	859	1,503	....	1,552
Walter Bro. & Co.	....	.....	....	12,750
Williams & Herring	95	195	....	.....
Other shippers	16	118	....	12,405
Total	10,334	42,804	....	1,066,307
Corresponding week last year	23,117	104,094	....	888,784
Increase	....	.....	....	177,523
Decrease	12,782	61,290	....	

Cumberland Coal Trade.

By Railroad.

Statement of Coal shipments over the Baltimore and Ohio Railroad for the week ending Dec. 29:

	Tons.
From Eckhart R. R	
Blaen-Avon Company	316 18
Spruce Hill	197 01
Cumb. C. & Iron	.....
From Cumberland and Pa. R. R.	
Consolidation Company	304 09
Borden Mining do	426 12
American do	11 04
	1,252 03
From George's Creek via. Piedmont.	Tons.
George's Creek Coal and Iron Company	141 01
American Company	.....
Central do	1,084 10
Atlantic do	515 04
Piedmont do	146 16
Swanton do	569 14
Barton do	487 10
George's Creek Mining Co.	595 10
Potomac do	368 00
Franklin do	894 04
Hampshire do	1,540 01
Total	6,392 19

GAS COAL. From Mines West of Piedmont	Tons. 1,750 00
Transportation since 1st of January.	Tons. Cwt.
From Companies by Eckhart R. R.	48,537 07
From do C. & P. R. R.	140,536 18
From do via. Piedmont	576,893 18
From West of Piedmont. Gas Coal	56,970 00
Total	822,938 03

Prices of Coal by the Cargo.

At New York, Jan. 5, 1867.

Schuylkill Red Ash by Boat Load	$7 00@	$7 50
" Chestnut, " "	4 50	5 25
" White Ash Lump	6 25	6 75
" Steamboat	6 25	6 75
" Broken	6 25	7 00
" Egg	6 52	7 00
" Stove	6 50	7 00
" Chestnut	4 75	5 50
Lehigh White Ash Lump	6 50	7 00
" Broken	6 50	....
" Egg	6 25	....
" Stove	6 75	....
" Chestnut	5 50	....
Western Virginia Gas Coal	10 00	....
Westmoreland Gas Coal	10 00	....
Blossburg & Fall Creek	7 25	7 40

At Philadelphia, Jan. 5, 1867.

Schuylkill Red Ash Prepared	$5 50@	$6 00
" Chestnut	4 00	.. ..
" White Ash Lump and Steamboat	5 00	.. ..
" Broken	5 00	.. ..
" Egg and Stove	5 25	.. ..
" Chestnut	4 00	.. ..
Locust Mt. Lump, and Steamboat	5 25	.. ..
" Broken	5 25	.. ..
" Prepared	5 50	.. ..
" Chestnut	4 25	.. ..
Lorberry Coal	5 75	.. ..
Shamokin	5 75	.. ..
Franklin, (Lykens Valley)	6 25	.. ..
Broad Top	5 50	.. ..

Scranton Coal at Elizabethport, Jan. 5, 1867.

Lump	$4 50@	— —
Steamer	5 25	— —
Grate	5 50	— —
Egg	5 50	— —
Stove	6 00	— —
Chestnut	4 25	— —

Prices for Pittston Coal at New York, Jan. 5, 1867.

Lump, per ton of 2240 lbs	$6 25	.. ..
Steamer, " " "	6 35	.. ..
Grate " " "	6 40	.. ..
Egg " " "	6 50	.. ..
Stove " " "	6 75	.. ..
Chestnut "	5 50	.. ..

Lehigh Coal at Elizabethport, Jan. 5, 1867.

Lump	6 75@	$7 00
Steamboat and Broken	6 50	— —
Egg	6 50	— —
Chestnut	5 50	6 00
Stove		7 00

George's Creek and Cumberland Coal.

Run of mine, f. o. b. at Locust Point	$5 75@	.. ..
At Georgetown	5 50	.. ..

At Baltimore Jan. 5, 1867.

Wilkesbarre & Pittston W. A., wholesale	$7 50@	$7 75
" " " retail	8 25	8 50
Lykens Valley & Sunbury R. A., wholesale	7 50	7 75
" " " retail	8 25	8 50

At San Francisco.

Duty Bituminous $1.25. Other kinds 40 cents per ton.

(From the Mercantile Gazette.)

Australian	$9 00@	9 50
Do Wallsend	9 50	10 00
Pittston, Um	17 00	.. ..
Lehigh	18 00	.. ..
Cumberland, ex ks	24 00	25 00
" do bulk	22 00	.. ..
Scranton	17 00	18 00
Liverpool	.. ..	.. ..
Scotch	.. ..	.. ..
West Hartly	12 00	.. ..
Vancouver Island	11 00	.. ..
Bellingham Bay	10 00	.. ..
California	6 00	8 00

Prices of Foreign Coals.

[REPORTED FOR THE JOURNAL OF MINING.]
BY H. L. PARMELE & BRO., 32 Pine street, N. Y.
Duty $1.25 per ton.

Liverpool Gas Caking	$11 00
" " Cannel	16 00
" House	19 00
" " Orrel	16 00

Per ton 2240 lbs.
PRICES FROM YARD:

Liverpool Orrell, screened	20 00
" Cannel, "	22 00

per ton 2000 lbs. delivered.

Prices of Provincial Coals.

[REPORTED FOR THE JOURNAL OF MINING.]
BY LOUIS J. BELLONI, JR., 43 Pine street, N. Y.
Duty $1.25 per ton.

Block House (on board)	....	$1 75 gold
Gowrie	"	1 75 "
Lingan	"	1 75 "
Sidney	"	2 28 "
Pictou	"	2 25 "
Glace Bay	"	1 75 "
International Co.	"	1 75 "
Slack Coal	"	75 "

Coal Freights.

From Baltimore.

To Philadelphia	$2 50@	— —	Boston 3 75@ — —
New York	2 25	— —	

From Georgetown or Alexandria.

To Philadelphia	$2 50	— —	Boston 3 50 3 75
New York	3 25	3 50	

From Elizabethport.

Albany	$1 00@—	—	New London	1 30@—	—
Boston	2 00	—	Newport	1 50	—
Bridgeport	1 20	—	New York	70	—
Fall River	1 50	—	Norwalk	1 20	—
Hartford	1 75	—	Norwich	1 40	—
Hudson	1 60	—	Pawtucket	1 75	—
Lynn	—	—	Portland	2 00	—
Middletown	1 50	—	Portsmouth	2 15	—
New Bedford	1 50	—	Providence	1 50	—
Newburyport	2 25	—	Salem	2 00	—
New Haven	1 20	—	Taunton	1 40	—

By Railroad.

Transportation from Schuylkill Haven to Pt. Richmond	$2 25
Freight from Pt. Richmond to New York	1 60
Total	$3 85

From Port Carbon 8 cents per ton more.

Freights on Coal to Elizabethport.

L. V. R. R. from Mauch Chunk to Easton	$1 15
C. R. R. of N. J., Easton to Elizabethport	1 66
	2 85
Shipping expenses at Elizabethport	30
Total	$3 11

Provincial Freights.

Sydney to N. Y.	$4 50
Lingan	4 50
Cow Bay	4 50
Big Glace Bay	4 50
Little "	4 25

Foreign Freights.

New Castle and Ports on Tyne	19s@ keel.
Liverpool	15s.@ 20s

WEEKLY COAL TRADE CIRCULAR.

NEW YORK, Jan. 4, 1867.

Nothing new in trade. The Scranton auction sale of this week showed a slight advance over the rates realized at the *previous* sale, indicating that bottom is touched for the winter in any event. It is expected, if the transportation companies open their tolls (as they should do) very low at the *commencement* of the coming season, that prices will start low, and gradually advance as the season progresses, but it is somewhat too early to hazard any reliable opinion as to the course of the *spring trade*. Much depends upon the winter. Stocks are not heavy in dealers' hands, and if the present cold weather holds on, the market will open very bare of Coal, and a *lively* spring trade will be the result. P.

COPPER ORES.

NEW YORK, Jan. 4, 1867.

25 @ 50 per cent	$4 87½@5 00
20 @ 25 "	4 50 4 87½
15 @ 20 "	4 25 4 50
10 @ 15 "	3 75 4 25

No business since last report. Prices unchanged.

BALTIMORE, Jan. 3, 1867.

50 per cent and over (Currency)	$4 85
25 " "	4 25
15 " "	4 00
10 " "	3 75
6 " "	3 25@3 50
5 " under	—

Prices unchanged—miners show a disposition to sell for payment in copper.

BOSTON STOCK MARKET

BOSTON, Jan. 31, 1867.

The market, since our last, has shown a decidedly downward tendency. Coppers have been on the downward track with hardly an exception. In Petroleum Stocks sales have been made of Beebe Farm at $3; Crescent has been selling in considerable quantities at 3c. per share, which is much below its intrinsic value, and 5c. is now offered for any amount; Sc. is offered for Mass. and Oil Creek, at which price there are few sellers; some heavy sales have lately been made in Pepper Well at 5½c. per share; Coal Stocks are offered low, with few buyers; Bishop and Mahoney is offered at $5 50, without finding purchasers at that figure; Gilberton is offered at $20; Harleigh weak, at $45 bid, $49 asked; Mammoth Vein has sold down to 31, and few buyers at that figure; Short Mountain is offered at $15; Summit Branch is the one bright spot in our list of coal stocks, and $11.50 is freely offered for it, which is nearly double the price at which it was offered about a month since; Caledonia Gold is in demand at low figures; and Montezuma Gold had sold down to 75c., at which price there are many buyers; it is rumored that Franklin Telegraph has been bought up, and $12 is offered without bringing out any of the stock; Insulated Telegraph has sold down to $7 per share, and $7 ½ is now bid for it. It seems to be the general impression that the stock will go higher after the meeting to be held to-day. THOS. C. LOMBARD & CO.,

99 State street, Boston.

(By Telegraph.)

BOSTON, Jan. 4, 1867.

Canada	50c.	Minnesota	11½
Copper Falls	46	Quincy	36
Franklin	34	Cary Improvement	11
Hancock	8½	Water Power	30½
Huron	31	Central	—
Isle Royal	7	Bay State	—

SALES AT BOSTON STOCK EXCHANGE, JANUARY 3.

100 shs Water Pr	b.30 30½	225 shs Pewabic	25
150 do do	30½	50 do Huron	32
100 do Bay State	9¾	200 do Petherick	3
500 do Canada	55c	25 do Quincy	37½
250 do Cop. Falls	46½	300 do Rockland	¾
100 do do	b.60 48	100 do do	b.60 9
100 do do	b.30 47¼	250 do Isle Royal	8½
50 do Dana	1½	250 do do	b.60 8¾
100 do Eagle R	5	SECOND CALL.	
100 do do	2¾	250 do Hancock	8½
150 do do	2¾	681 do Superior	8¾
225 do Hancock	8¾	200 do Copper Falls	b.30 47
400 do do	8½	182 do Hecla	50
100 do do	b.30 8¾	50 do Mesnard	1½
100 do Hanover	1½	50 do St. Clair	5¾

FOREIGN MARKET REVIEW.

Weekly Metal Report.

LONDON, E. C., Dec. 14, 1866.

There is more steadiness in the Metal Market, and not only has the downward tendency of several articles been arrested, but a slight improvement in prices has taken place. The amount of business reported has been considerable.

IRON.—The position of the Welsh Iron trade has undergone no change since our last. There is every probability of a reduction in wages, which, if carried out, we trust will be beneficial to the trade in general. Staffordshire descriptions are dull. Scotch Pig Iron has further improved to 54s. 9d. cash.

COPPER.—There has been a decided improvement in demand, and holders are more hopeful. Second-hand parcels of raw English find now buyers a trifle under smelters' quotations; manufactured is also firmer. In Barra business has been done at £83; Wallaroo, £82; and Chili bars have been in brisk demand in Liverpool from £74 10s. up to £76.

TIN.—The market is decidedly firmer, and more business would have been done if holders had been willing to supply the demand. Straits had changed hands at £81 10s. and £83 cash, and Banca at £83. The Dutch market has advanced to 48½ll. buyers. English Tin a little firmer.

TIN PLATES.—No alteration to report in price, demand rather slack.

LEAD.—Prices without material change.

SPELTER.—Some large sales reported for delivery in out-ports during next month. Common brands £21 15s., and Specials £22. A few small parcels of London Spelter have changed hands at the following prices; Common, £21 15s.; January, £22 2s. 6d.

VON DADELSZEN & NORTH.

Oil Trade Circular.

LONDON, Dec. 14, 1866.

The transactions of the week have been large, and the market shows a decided improvement, not altogether as regards advance in price, but firmness. The floating cargoes of Petroleum are nearly all ordered to the continent, and the stoppage of the Coal Oil works may soon cause a scarcity and necessitate better prices. It has already been felt to some extent in the market for Lubricating Oil, the Welsh being about the best quality and giving the largest percentage.

REFINED PETROLEUM.—Best, 1s. 6d. per gallon.
PETROLEUM CRUDE.—Flat, £15 15s. per ton.
SPIRIT.—Without improvement.
LUBRICATING OIL.—Sells freely at £12 to £21 per ton.
REFINED COAL OIL.—Best, 1s. 4d. per gallon.
ONCE RUN.—Continues neglected.
CRUDE.—No buyers.
GREASE.—£5 to £16 per ton.
PARAFFIN SCALES.—3d. to 4½d. per lb.
PITCH.—20s. to 35s. per ton.

STRANGE BROTHERS & Co.

SAN FRANCISCO STOCK MARKET.

Latest by Telegraph.—Dec. 29,

Name.	Bid per foot.	Name.	Bid per foot.
Gould & Curry	625	Crown Point	1.25
Savage	2100	Yellow Jacket	1250
Chollar-Potosi	210	Belcher	135
Ophir	140	Alpha	1 5
Hale and Norcross	2800	Imperial per share	130
Cal. Steam Navigation Co	64	Cal. State Telegraph Co	32

NEW YORK METAL MARKET.

(CORRECTED WEEKLY.)

COPPER	Detroit, ₰ lb., cash	27	27
	Portage Lake	27	27½
	Baltimore	26½	—
	Fig Chili	—	—
IRON	Bolts	42	43
	Braziers	43	—
	Sheathing	40	45
	Yellow metal	30	—
	Pig, No. 1 Scotch, ₰ ton	47 00	51 00
	No. 1 American	50 00	51 00
	No. 2 "	45 00	47 00
	No. 2 Charcoal	46 00	47 00
	Bar, Swedish, assorted sizes	—	170 00
	Amer. and Eng refined	115 00	—
	" " common	105 00	—
	Rails, American at Works	82 50	90 00
	" English (Gold)	52 00	55 00
	Horse shoe iron	140 00	150 00
	Rods 5-8@3-16	120 00	175 00
	Band	145 50	—
	Nail rods	9¾	10¾
	Hoops	150 00	210 00
	Sheets, Russian, ₰ lb	21	23
	" English "	6½	8
	" American "	—	—
	Boiler Plates, English	—	—
	" American	—	—
STEEL	English, cast, (2d & 1st q) ₰ lb	18½	24
	" Spring " "	9	14
	" Blister " "	12½	19
	" Machinery "	14	26
	" German, (2d & 1st q)	16½	17½
	American Blister, Blk Dmd	11½	17
	" Cast, Tool, "	19	—
	" Spring, "	12	15
	" Machinery, "	15	—
	" American German,	13	14
LEAD	Galena	—	—
	German (Gold) refined	6 75	—
	Spanish "	6 75	—
	English "	6 75	7 00
	Bar (nett)	—	10 00
	Pipe and sheet "	—	10 25
TIN	Banca, gold	22½	24
	Straits	21¾	22
	English	—	21½
TIN PLATES	IC charcoal, ₰ box (Gold)	9 25	10 00
	IC Coke "	7 75	8 75
	Charcoal Terne "	9 25	10 00
	Coke Terne com "	6 75	7 00
	" best "	7 75	8 50
QUICKSILVER		85	90
SPELTER	American, per lb., currency	8½	9¼
	Foreign " gold	6½	6¼
ZINC	Sheet	12	12½
SOLDER	No. 1	24	—
	No. 2	22	—

☞ In South Australia a question had been introduced by the Government Council, and passed unanimously, for the construction of a railway from Port Augusta to the mineral districts of the North. Coal is reported to have been discovered in the Port Lincoln district.

Patent Claims.

Interesting to Miners, Millmen, Metallurgists, Oil-Men and Others.

The following claims have recently been issued, from the United States Patent Office:

60,595.—DRILL FOR ROCKS, WELLS, ETC.—R. S. Torrey, Bangor, Maine:

I claim, 1st, The self-operating reversible ratchet, J, so constructed that it will reverse its motion with the same stroke and will give the desired motion to the drill at every vibration of the walking-beam, B, for drilling purposes, in combination with the friction-roller and spring, L.

2d, I claim the dog or hand, K, connecting rod, P, Figs. 1, 2 and 7, adjustible slide, N, Figs. 1 and 2, nut, 3, sleeve, 2, Fig. 6, which is attached to the centre post, A, Fig. 1, in combination with the circular slanted plate for regulating the stroke of dog or hand, K, fig. 1, to each stroke of the walking beam, B, in the manner and for the purpose substantially as described.

3d, I claim the reversible shaft, H and H', Fig. 3, in combination with the gear, A, and the pinion, 4, Figs. 1, 2 and 3, the whole operating in the manner and for the purpose set forth.

60,653.—TOOL FOR CLEANING BOILER TUBES.—Sidney Van Auken, Binghampton, N. Y.:

I claim the double yielding spring arms, B, in combination with the segmental scraper, C, and cams, a, b, constructed and operating substantially as and for the purpose set forth.

60,654.—REVERBERATING FURNACE.—J. M. Whiteside, San Francisco, Cal.:

I claim, 1st, The arrangement of a revolving stirrer in combination with the oven, A, constructed and operating substantially as and for the purpose described.

2d, The protecting cap, b, in combination with shaft, C, which gives motion to the stirrer, substantially as and for the purposes set forth.

3d, The arrangement of the supply-tank, E, and stop-cock, i, which is operated automatically from the driving-shaft, C', in combination with the generator, h, tube or tubes, g, and the oven, A, constructed and operating substantially as and for the purpose described.

Special Scientific Brevities.

☞ A reverberatory furnace has just been patented by J. M. Whiteside, of San Francisco, which consists in the arrangement of a revolving stirrer, to which motion is imparted by mechanical power in combination with the hearth of a reverberatory in such a manner that the operation of stirring and moving a mass of pulverized ores while roasting or chloridizing in the reverberatory furnace is materially facilitated. The furnace in which the ore is roasted is covered up, and arranged so that all but superheated air is excluded therefrom while the same is in operation, and furthermore, jets of superheated steam are injected over the ore on the hearth, to facilitate the disintegration and chloridization of the same.—*Sc. American.*

☞ P. W. Hofmann describes a process for recovering peroxide of manganese from chlorine residues. He takes the waste chloride of manganese and treats it with soda waste, the sulphide of calcium in which precipitates the manganese in the form of sulphide. The sulphide of manganese is collected and exposed to the air, by which it is oxidized to sulphate. This is dried, and then roasted with nitrate of soda. Nitrous acid is liberated and utilized when possible, and sulphate of soda and binoxide of manganese are left. The sulphate of soda is washed away with water, and binoxide of manganese is left.

☞ M. H. Micolon, of Paris, proposes a new alloy for the manufacture of bells, hammers, non-cutting tools, etc. It consists of 20 parts of iron turnings or tin waste, 80 parts of steel, 4 parts of manganese and 4 parts of borax; but these proportions may be varied. When it is desired to increase the tenacity of the alloy, 2 or 3 parts of wolfram are added. When the cupola is ready, the iron and steel are poured in, the manganese and borax, and the vessel filled with coke.

☞ Prof. Faraday has demonstrated that the electricity evolved during the combustion of a few grains of charcoal or a common candle would, if arranged in a continuous circuit, exceed that of the most powerful batteries. The theory is that the heat generated by combustion is owing to the union of the two electricities. If a key to this source of power could be discovered, a new career, almost, would be opened to science and mechanics.

☞ The number of forges and large foundries in Prussia amounted in 1865 to 1,421, of which 1,096 are of a certain importance. The total production represented 1,610,000 tons of common metals, and 6,701 lbs. of silver, representing a value of £5 846,187. The workmen were 80,470 in number, reckoning with their families 257,970 individuals.

☞ Mr. Bidder has estimated that in Whitworth's 3 lb. gun, 8 ozs. of powder exert a force of 28,000 horse power for the two-hundredth part of a second. The force derivable from 1 lb. of powder is less than one-third that may be obtained from 1 lb. of coal, when burnt in the furnace of a steam engine.

☞ A quick process for getring drying linseed oil is given by Dr. Duflo. He boils the raw oil for two hours with binoxide of manganese and hydrochloric acid, and so gets a rapidly drying oil in very much less time than by the processes generally employed.

☞ Dr. Richardson states that iodine placed in a small box with a perforated lid, destroys organic poisons in rooms. In cases of small-pox, he has seen this method used with great benefit.

Mineral and other On-dits.

☞ The Director of the Geological Survey of India, Dr. Oldham, states, in his last reports on the coal fields, that about 400,000 tons are raised annually in Eastern Bengal, while the large deposits in other parts of the empire appear to be neglected. The great beds in the valley of the Nerbudda, and in the Kurhurbari district still lie undisturbed, but the latter will soon be traversed by a railway a chord of the East Indian line. Another extensive deposit is the Pench coal-field, discovered in 1852 by a missionary, the Rev. J. Hislop, in the Chendnara district of the Central Provinces, which is described as the thickest in India. Assam, too, besides its plantations of tea, abounds in coal of "rich" quality. Hence, it is expected that, in course of years, there will be a great coal trade in India.

☞ A most alarming subsidence of the ground, occasioned by coal excavations beneath, recently took place at Newton, near Stourbridge, England. Fortunately, the earth first

opened in the backyard of a public-house, and before the fissure had widened into a gulf a considerable amount of property was saved. Some buildings in the yard and back kitchen were, however, swallowed up. The colliery which extends through a portion of this district belongs to Lord Dudley.

☞ At the works of the Magnesium Company, Manchester, owing to the recent floods in that part of the country, a very narrow escape from a tremendous explosion occurred. About 4 cwt. of sodium was stored in one part of the works, and here the water rose to within an inch of the mouths of the jars containing it. The roof had to be unslated to allow the men to get it out before any damage took place.

☞ Immense deposits of fluor spar, fine-grained and closely resembling indigo, have been found on the James river, Colorado. It is suggested that these deposits may become valuable for the purpose of dissolving quartz in fluorine.

☞ The electrical fuse for firing blasts is in very satisfactory use in Europe. The engineer at the Ast tunnel (Innspruck and Bozon railway) states that 30 holes of great depth have been blasted simultaneously by this apparatus.

All Sorts.

☞ Several of the newspapers have perpetrated jokes on the travels of "Sic Transit," whom "mihil ha," and "noctes" head off, the *Yale Courant* retorts as follows: Oh, "unum" sculls! You "damnuh" sculls! He didn't either. "Sic Transit" drove a "tu ponie tandem temo Ver" from the eastward. He is visiting his "ante," Mrs. "Dic Terra," in this city, and will stay till "Ortem" Dr. Dignos, the "Terris" (Terrys), likewise "et super" with us last evening. He "eta beta pi." The pugilist also "cum" with him and "lamb da" man badly in the street. He "cutis nos" off, and "nocteni flat urna" flounder.

☞ The following is given as a New Year's puzzle well worth studying over:

I
F Y
O U O
W E F O
R Y O U R
P A P E
R P A
Y U
P

☞ A certain Dutch Justice of the Peace, over in Jersey, had a case before him, in which one party charged the other with biting his nose off. The defendant denied the accusation, stating that the plaintiff had bitten it off himself. Our worthy judge, after mature deliberation, delivered the following opinion: "Mit Gott, everydings is possible. Vell, if Gott is willing a man shall bite his own nose off, he must do it. De brisoner is discharged, and de blaintiff can go home und never do so no more."

☞ An anecdote is told of the Bishop of Exeter in England. The scene is a church at Torquay; the Bishop is present, but not officiating, and he sits with the congregation. The officiating clergyman ventures to soften to ears polite the phrase, "eat and drink their own damnation." He reads it "condemnation." A voice is heard energetically exclaiming, "Damnation!" The whole church is startled. But it is not a profane epithet they hear, it is the voice of the Bishop in rebuke of the officiating minister.

☞ An Irishman, from Battle Creek, Mich., was at Bull Run battle, and was somewhat startled when the head of his companion on his left hand was knocked off by a cannon ball. A few moments after, however, a spent ball broke the fingers of his comrade on the other side. The latter threw down his gun and yelled with pain, when the Irishman rushed to him, exclaiming: "Blasht ver sowl, ye ould woman, stop crying; ye make more noise about it than the man that losht his head."

☞ The pen in the hand of one who knows how to use it, is one of the most powerful weapons known. As the tongue of the absent, how charming! When virtue guides it, how beautiful! When self-respect gives a new vigor, how pleasing! When honor directs it, how respected! When wit sharpens it, how fatal! When scurrility wields it, how contemptible! 'Tis the weapon of the mind!

☞ A young lady of thirteen, says a Paris paper, Miss Dumesnil, is said to be imbued with a fluid of an extraordinary attractive power, which attracts all objects of wool which surround her. Chairs and tables are instantly attracted towards her when she approaches near to them. She has only become possessed of this attractive faculty for the last three weeks.

☞ It is announced from the Chincha Islands that the guano is disappearing so fast that in the course of a few years the supply will be exhausted, and those islands be again given up by man to the acquatic birds of the Pacific. The average number of vessels engaged in loading guano is stated at ninety.

Manganese.

Mr. Chas. T. Girovert, of Rienzi, Missouri, writes to an exchange relative to the black oxide of manganese: One of the richest and perhaps the softest species of this ore ever found, was discovered in Arkansas, just before the war, by an English proprietor of manganese mines in Germany. This gentleman was induced by a statement of the late geological surveyor of Arkansas, to come over and search for a conjectured deposit near Polk's Bayou. It was found, in the mountains to the left of Law's Creek, which empties into Polk's Bayou about two miles from Batesville, and pronounced by the discoverer saperior to any that he had ever worked. There is a good deal of the harder species in Independence county, especially on Lafayt Creek.

Peat Iron.

The Montreal *Gazette* notices the first bloom made in that part of the world with pure peat fuel, and pronounces it of the very highest quality, equal to the best Swedish iron. The bar was bent cold by a vice, and doubled up close at right angles with an edge, without a crack or flaw appearing, the outer corners remaining smooth and sharp: a test which it is said no coal-iron made in Canada will stand. The fact is of great importance to Canada, in view of her large supplies of peat and iron.

A New Excavator.

A Belgian engineer has invented a machine, called the "excavator," which, worked by a machine of six horse power, can, in ten hours, break up and cart off upwards of 2,400 cubic yards of earth. The invention has been applied with great succes in some public works now going on at Brussels, and the results anticipated from this machine are enormous.

SPECIAL NOTICES.

☞ The *Scientific American* reaches us this week in an entirely new shape, having been enlarged in such a manner as to make its reading matter about one inch wider and two inches longer than that of the JOURNAL OF MINING. Advantage has been taken of this additional space to render it more valuable than ever to the mechanic, manufacturer and man of general science, and while we cannot help believing that it would have been better taste to have increased the pages in number, instead of in size, yet we must congratulate its readers on their securing so much more practical information every week. The *Scientific American* of this week also contains an unusual number of fine engravings, among which is a full page view of the Park Building, showing the offices of the JOURNAL OF MINING as well as those of the *Scientific American* and Munn & Co.'s great Patent Agency.

☞ The U. S. Blasting Oil Company is now prepared to fill all orders for Nitro-Glycerin. We call attention to the auvertisement of the company on another page, from which it will be observed that Col. Tal. Shaffner intends proceeding against all who infringe the patent which he has purchased from Prof. Nobel.

PROSPECTUS.

THE NECESSITY FOR A THOROUGHLY RELIABLE medium of information upon MINING MATTERS has been seriously felt by those interested in the mines and mills of the United States. THE AMERICAN JOURNAL OF MINING supplies that want.

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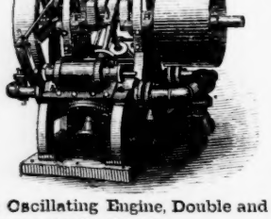

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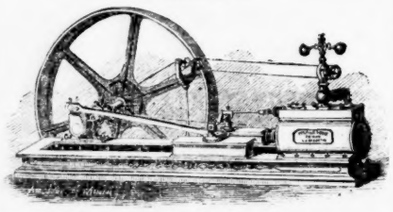

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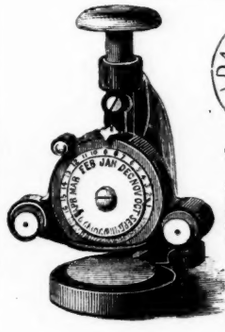

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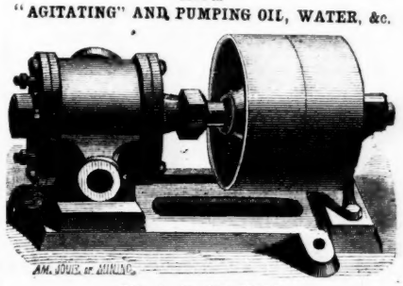

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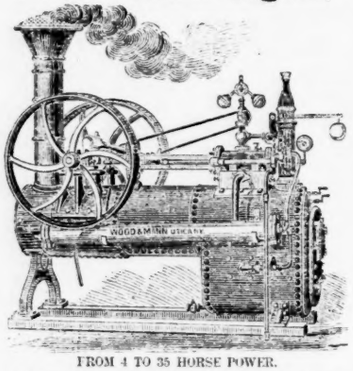

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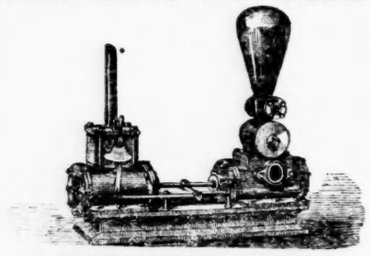

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